The SHORT WAVE Magazine

2/6

VOL. XV OCTOBER, 1957 NUMBER 8

FOR THE RADIO AMATEUR AND AMATEUR RADIO

INDEX TO ADVERTISERS

SHORT WAVE MAGAZINE

VOL. XV OCTOBER 1957 No. 170

CONTENTS

Managing Editor: AUSTIN FORSYTH, O.B.E. (G6FO)

Advertisement Manager: P. H. FALKNER

Published the Friday following the first Wednesday each month at 55 Victoria Street, London, S.W.1. *Telephone: Abbey 5341/2*

Annual Subscription: Home and Overseas 30s. post paid.

AUTHORS' MSS

Articles submitted for Editorial consideration must be typed double-spaced with wide margins on one side only of quarto or foolscap sheets, with diagrams shown separately. Photographs should be clearly identified on the back. Payment is made for all material used, and it is a condition of acceptance that full copyright passes to the Short Wave Magazine, Ltd., on application.

THE NEW 'HAM' SHOP

COMMAND TRANSMITTERS. 2.1-3 Mc/s, valved with crystal, 25/-; 3-4 Mc/s, valved with crystal, 25/-; 4-5.3 Mc/s, valved less crystal, 17/-; 5.3-7 Mc/s, valved less crystal, 17/-. P. & P. 3/- each.

COMMAND RECEIVERS. 1.5-3 Mc/s, fully valved, 65/-. P. & P., 3/- each.

MODULATORS for above, 25/- each. P. & P., 3/-.

62A INDICATOR UNIT. Complete with VC97 with mu-metal screen. 12-EF50, 4-SP61, 3-EA50, 2-EB34. Plus pots, switches, H.V. Cond., Resistors, Double deck chassis and crystal. Less drive 50/-. Carr. 7/6.

BENDIX RECEIVER MN26.C. Covering 150-1500 kc/s in 3 bands. Valves used 5-6K7, 2-6N7, 2-6J5, 1-6F6, 1-6L7. Complete with switching motor and dynamotor. This superb unit has been modified for 12 v. operation. Only 80/-. Carriage 8/6.

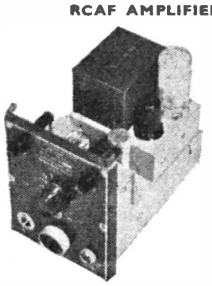
PARMEKO C CORE TRANSFORMER. Inter-valve Transformer. Ratio 4/1 600 ohms CT. 1¼in. x 1¼in. x 2in. Original cartons. 6/- post paid.

INDICATOR UNIT SLC No. 5. Ideal for conversion into an Oscilloscope using a 139A or ACR 10 tube. Unit consists of 2-VR65's, 1-VR66, various resistors, condensers and pots. Size 11 x 6 x 3in. Brand new, complete with modification circuit. 20/-, P. & P. 3/-.

373 MINIATURE 9.72 I.F. STRIPS. Supplied complete with 3-EF91, 2-EF92, 1-EB91. Ideal for modification to FM Tuner as described on page 107 of the April "Practical Wireless." Price 45/- each.

AMERICAN GEARED MOTOR. 24 v. D.C. with built-in precision gear-box. No. 1 drive 24 R.P.M. No. 2 drive 6 R.P.M. On 12 v. No. 1 drive 16 R.P.M. No. 2 drive 4 R.P.M. Overall size of motor and gearbox 7¼in. x 3¼in. x 3in., weight 1 lb. 14 ozs. Brand New. Only 22/-. P. & P. 2/-.

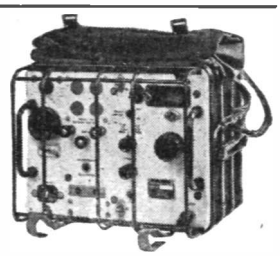
RCAF AMPLIFIER KIT



12 v. input Vibrator Pack 250 v. output OZ4. Microphone Transformer into a 6K6 GT output valve with negative feed back. Size 8in. x 5¼in. x 8¼in. Brand new, 35/- each, P. & P. 3/-.

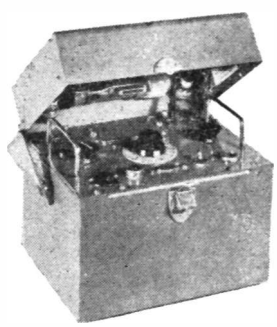
R109 RECEIVERS

8 valves, 5-ARP 12's, 3-AR 8's covering 1.8-8.5 Mc/s on two frequency bands. Contains 6 v. Vibrator Pack and built-in 3½in. Goodman speaker, operates from 6 v. battery, consumption 1¼ amps. Housed in metal case 13 x 12 x 11in. Designed for Mobile or Ground station. Operates with any normal aerial. Complete and tested, including circuit. Very good condition. Only 80/-, carr. 7/6.



SPECIAL 'HAM' OFFER ! !

TEST SET 102



Consists of impregnated mains transformer 200-250v. 50 cycles 12v. 2 amps, 6v. 3 amp, output 280v. at 80 ma. S.T.C. metal rectifier 10 ma. 1-DET19, 1-6J5. Bulgin plugs, sockets and pilot lights. Mains leads. Circuit is a multi vibrator locked mains type, with a cathode follower. Can be modified for:

- Audio Amplifier.
- Audio Oscillator.
- V.F.O.
- External Synchronizer.
- Stabilized Power Unit.
- Modulator, Etc.

Brand new including circuit only 40/-, carr. 5/-.

ORIGINAL AR88 MAINS TRANSFORMERS

Input 110 volts-240v. Output 345-0-345 at 150 ma. 5v at 2 amps and 6.4v at 4.5 amps. Brand new, fully shrouded. 50/- p. & p. 3/-.

Relda Radio Ltd.

(Dept. "S"). 32A, Coptic Street, London, W.C.1
Phone: MUSeum 9607.

R.F. UNITS
R.F. 24, 20-30 Mc/s, 8/6 each
R.F. 25, 40-50 Mc/s, 8/6 each
R.F.26, 50-65 Mc/s, 25/- each
All valved. Postage 3/- on each.

AMERICAN TUNING UNITS

TU-7-B	4500-6200 KC
TU-8-B	6200-7700 KC
TU-10-B	10,000-12,500 KC

Price 14/- each. P. & P. 4/-.

U.S.A. INDICATOR BC929A. Complete with 3 BPI, shield and holder. Aerial switching unit. 7 valves: 2-6H6GT, 1-6X5GT, 1-2X2, 1-6G6, 2-62N7. Brand new. Original cartons. With modification circuit 60/-. Carriage 7/6.

VIBRATOR PACK. 6 v. input, 230 v. output at 100 mA, complete 4-pin vibrator, OZ4 rectifier. Fully smoothed, 25/6 each. P. & P. 2/6.

3 CM MAGNETRON/KLYSTRONS ASSEMBLY includes: 1 725A Magnetron; 2 723A/B Klystrons; 2 CV253 Crystal Diodes; 1 1B24 TR Tube; 1 CV115 ATR Tube.

ASSOCIATED WAVEGUIDE ASSEMBLY PRICE, £7 10 each, P. & P. 7/6.

PULSE TRANSFORMER AND MAGNET FOR ABOVE, £3. Carriage 10/-.

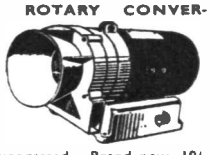
DIPOLE AERIAL No. 4A. 32 foot hard drawn 7/22 copper wire with centre insulator, fitted with feeder sockets. Both ends have 3 link insulators and slotted wire adaptors. Brand new price 9/-. P. & P. 2/-.

WESTINGHOUSE PENCIL RECTIFIER. Type 1.50, output 500 v. at 5 mA 5/- post paid.

HOOVER ROTARY TRANSFORMERS. 11.5 v. input, 490 v. output at 65 mA and 6 v. input 300 v. output at 75 mA. Guaranteed and tested, only 27/6. P. & P. 2/6.

HIGH RESISTANCE HEADPHONES. Type Mk. IV 4,000 ohms, with cord and plug. Brand new 11/6 each. P. &. P. 1/6.

AMERICAN ROTARY CONVERTORS



With cooling Fan. Input 12 v. D.C. Output 300 v. at 90 mA. Completely suppressed. Brand new. 19/- each. Plus P. & P. 3/-.

FOR THE RADIO AMATEUR AND AMATEUR RADIO

The SHORT-WAVE Magazine

EDITORIAL

Opening *With autumn now upon us, the season for Amateur Radio can be said to be opening—and it should be one of the most interesting and successful, as well as the busiest, yet experienced in the history of Amateur Radio.*

With tens of thousands more stations on the air, throughout the world, than there were for the last peak period in 1947-'48, and favourable conditions for real DX developing on all HF bands, the congestion will be considerable, to say the least. This means that, in the interests of all concerned, the Phone/CW areas will have to be strictly observed and, where DX working is involved, contacts kept as short as possible to give others a chance with it.

On the HF bands it is, for most people, a case of a contact for the sake of a QSO for the QSL card; the name of the XYL, or " the weather here," are points of no interest-value whatever. In other words, the long chatty QSO with a DX station is likely to make the rest of the queue hopping mad. The admired operator will not be the man who can hold it longest, but he who can get the essential information through in the shortest possible time.

It may seem a sad thing to have to say all this, and there will be those who feel very strongly about rubber-stamp QSO's, but the fact is that the pressure on our DX bands is such that, during the peak periods, anything but short to-the-point contacts waste both ether space and somebody else's time on the air.

Those operators who, by reason of their personal circumstances, are able to avoid the busy periods on the DX bands (week-ends, and the evening hours) should always endeavour to do so. In this way, the time-space-location factor can be brought into play; when the HF bands are well open, DX can be worked on one or other of them at almost any time. When it is early-closing day in Brummapool, it is tomorrow morning in Australia and late evening in Calcutta, and the DX is there accordingly.

What it comes to is that for the 1957-'58 DX season, we shall all have to work strictly within the band allocations and keep contacts short — and avoid working Europeans during the busy hours when the DX is coming through.

Austin Forbes G6FO.

Checking the Polar Diagram

METHODS OF MEASUREMENT, AND A PORTABLE FIELD STRENGTH INDICATOR

N. P. SPOONER (G2NS)

It is much easier than it might seem, especially with a rotary beam, to plot the radiation characteristic of the array. This article explains how it can be done, and also gives the circuit arrangement for a suitable remote indicating device. The beam on which the two-band plots shown were obtained was actually a "Minibeam," the results with which will interest users of this well-known array.—Editor.

WHILE over-the-air reports are of great value in setting up a beam system they still do not build up the visual picture given by an actual plot, on paper, of the radiation pattern ; this, in no uncertain manner, indicates if there is a spurious side lobe, a large back lobe or a wide nose.

Only a simple remote-indicating Field Strength Meter is needed for making a survey of the beam performance. With fixed arrays, the best way of using such a measuring device is, first, to obtain an Ordnance Survey sheet of the immediate neighbourhood scaled at 50 ins. to the mile. Pencil radii drawn at distances of, say, 100 and even 200 feet from the aerial site will at once show what private property denies access for taking field strength meter readings. A wider circle may, however, be found to fall on or near to public roads and open spaces ; the drill from then onwards is to tour the neighbourhood, with a second operator at the transmitter, taking as many readings as possible along the circle chosen.

With a rotary beam, however, there is none of this running about ; the FSM is parked in one spot and remains there while the beam itself is turned. The FSM used during some recent beam tests consisted of a canned RF and detector stage with plug-in coils — *see* circuit. On the 0-500 μA meter in series with the detector valve anode HT supply (from a deaf-aid 22·5-volt battery) a standing current appears with the transmitter switched off and dips in the manner of a GDO when the carrier comes on, the dip becoming lower as the received signal increases in strength. (A fair guide to the state of the battery at any time can be obtained by memorising the initial reading ; a deaf-aid battery in any case always gives a better dormant life than does the grid-bias type.)

Making the Plot

If an old camera tripod can be found, the FSM should be mounted on it and a telescopic

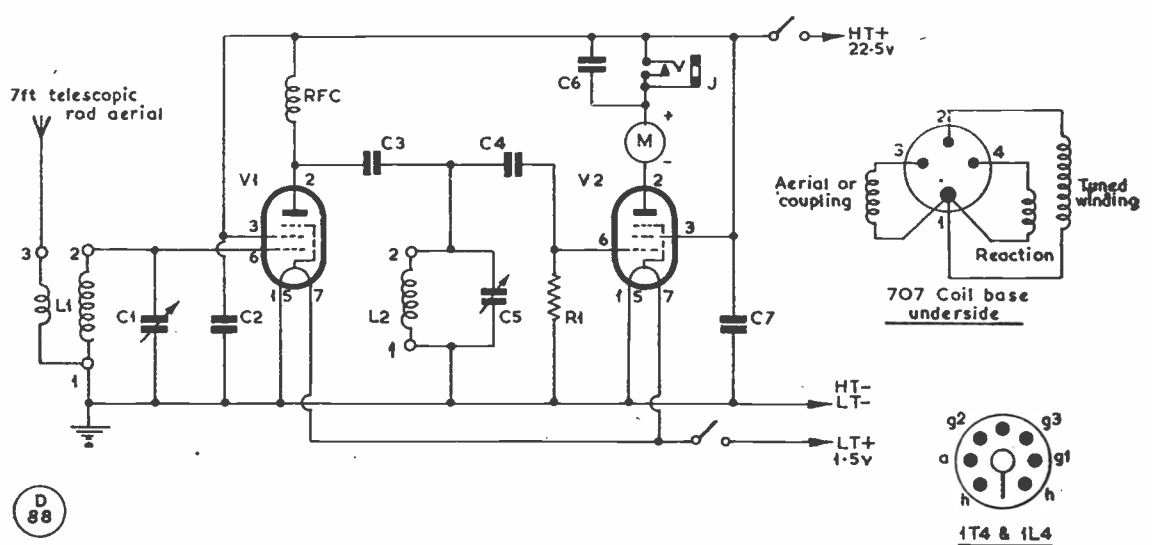


Fig. 1. Circuit of the field strength meter, battery operated, used for the determination of the figures shown in Fig. 2. A portable Box on these lines can be used for several purposes, including the tracing of noise interference. In this particular application, the circuits are made tunable to Ten and Fifteen, in order to check on the performance of a "Minibeam" on those bands. The method of use is explained in the text.

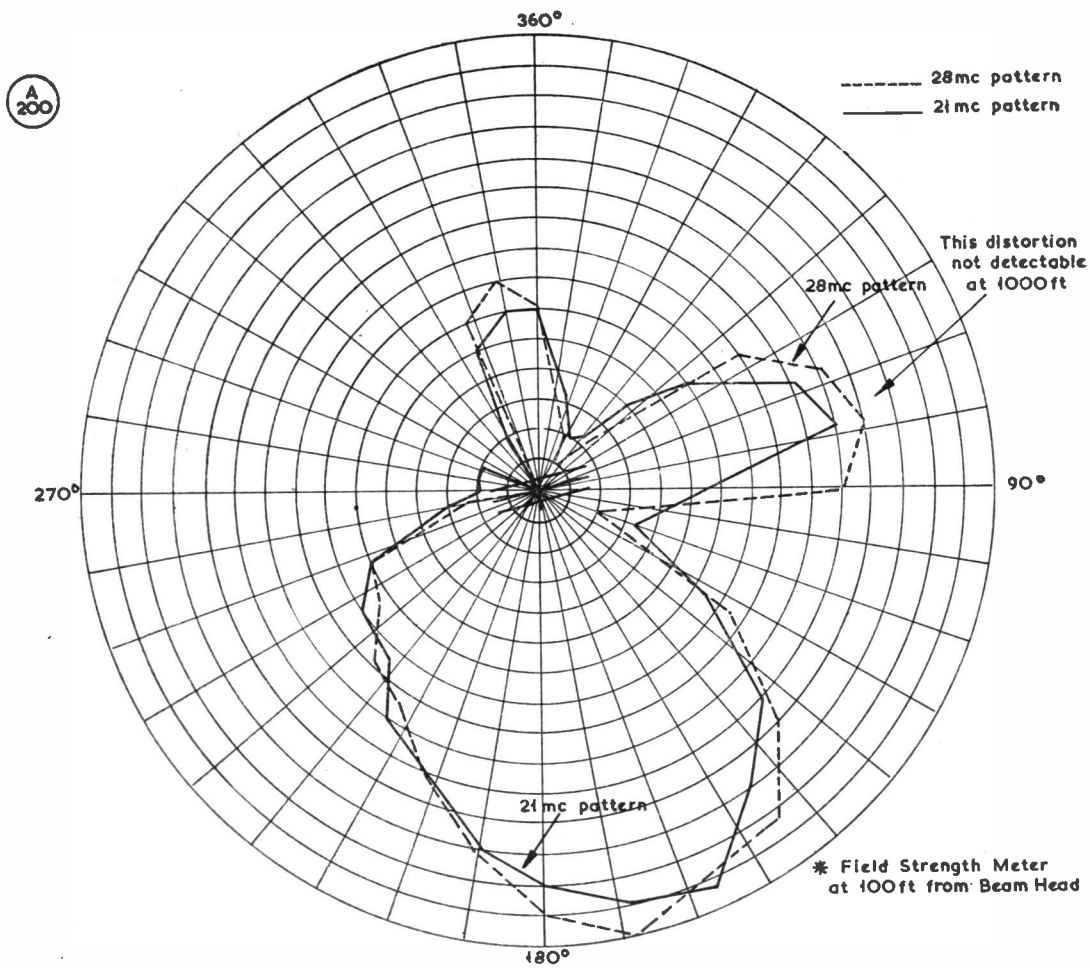


Fig. 2. Beam plot pattern obtained on two bands with a G4ZU-Minibeam, using the field strength indicator in the manner explained in the article. While these plots are not quantitative in terms of dB, they are entirely accurate as regards the field pattern referred to any receiving position. The readings were taken in what would be a representative built-up area, and the bulge in the 90° direction was found to be due to local site effect — see text.

rod aerial fitted to the meter—but any sort of mounting will do. To expedite the job, which entails transmitter switching, beam rotating, meter reading, logging and attendance to an inter-com system, three operators form an ideal team. G3BCI volunteered to switch the transmitter and maintain the same loading at all times, G3BQR read and logged, indicating when ready for more over a field-telephone set up alongside the FSM in a neighbour's garden 100 feet distant, while the writer moved and held the beam in 72 positions on 21 and 28 mc (36 for each band, a move being 10 degrees at a time), and checked by telephone with G3BQR which one was in use at any given moment. This inter-com arrangement obviated all message-carrying and the almost instantaneous band-switching possible with the station transmitter ensured the entire outside work being completed within an hour. The polar graph paper was obtained from W. F. Stanley and Co., Ltd., of 79 High Holborn, W.C.1 (9s. for a pad of 25), the size being 15¾ in. x 14¼ in. with a diameter of 30 cm.

Turning to the plots for two bands resulting

Table of Values

Fig. 1. Circuit of Battery Field-Strength Meter

C1, C5 = 100 $\mu\mu$F variable
C2, C7 = 0.1 μF
C3, C4 = 150 $\mu\mu$F
C6 = .002 μF
L1, L2 = Eddystone 706 miniature Plug-in Coils
LB Blue = 21 and 28 mc
Y Yellow = 14 mc.
Coil Base 707
R1 = 2 megohms
V1 = 1T4 (VT 173)
V2 = 1L4 (CV 1758)
J = Closed circuit Phone Jack
M = 0-500 μA meter
HT = Deaf-aid Battery -22.5v. (Drydex DH 522)
LT = Dry Cell · 1.5v. (Ever Ready U2)

from these tests and using a "Minibeam" array assembled according to instructions without any tuning whatever, the right-hand distortion looked at first like bad news—so an over-the-air check on the three bands was made with G2HNO at 1,000 feet range, with the gratifying report that there was no trace of it. This was later confirmed by G3BQR from his QTH two miles away. (G4ZU was also consulted by post and he replied with the comforting information that " strange patterns when measuring at close range are quite common even with commercial arrays on apparently open sites.") In the present case the beam was firing at the FSM through the neighbour's telephone lines and along his gutter, the G2NS gutter was running parallel and a TV aerial was in position on one chimney, *plus* radiation off the feeders and/or re-radiation from the mast rotation wires.

One point of interest to theorists: The left-hand distortion was when the flexible portion of the feeder came *in front* of the boom, the right-hand distortion when the same portion was *behind* the boom.

In regard to tuning any such beam array, the difficulty is that when it is in its final working position it is usually quite inaccessible and when brought down on to a ladder or steps it becomes unrotatable! The advantage of the Minibeam is that it is pre-tuned and should not require tuning or adjustment when mounted in the clear and at a height of 35 feet or so on 14 mc. There are no coils to become de-tuned in wet weather, and as the resistive losses are very much lower with the twin-boom loading sections used than could be the case with loading coils, the elements can be telescoped according to instructions, or the array can be dismantled and erected elsewhere with every prospect of the tuning remaining " on the nose."

Further Performance Checks

For those who are still doubtful whether optimum results are being achieved, there are various ways of ascertaining what is happening. The writer has an extra length of scaffold tubing to which have been welded two protruding pegs, wide enough apart to take a section ladder while it is being mounted for lashing. By means of a pair of double couplers (used in scaffolding erection) this tube can stand out from the cage like a lamp-lighter's arm and from a ladder lashed to it the telescoped sections of the director on the " Minibeam " can be reached for tuning on 28 mc, besides the director shorting bar for tuning on 21 mc. The reflector shorting bar is got at from the top platform, when desired, for minimum rear radiation adjustment on 14 mc.

Tuning of the beam can be carried out against a remote dipole, strung up some four or five wavelengths away, fed from a portable transmitter beneath it, the FSM itself being connected to the feed-point of the beam. Alternatively, the receiver can be connected to the beam instead of the FSM, and another station a mile or two away can transmit when requested. Yet a third method is to connect the transmitter to the beam and the FSM to the remote dipole, with its indicating meter extended back to a point where it can be read from the position in which the beam elements are being adjusted.

The fourth way is that adopted in the present case, when the beam was energised and slowly rotated for readings to be taken on the remote FSM with a rod aerial, the results being as shown. With ordinary arrays the process consists of first tuning the beam and then obtaining the best possible match between its feed-point and the feeder line. With the Minibeam, however, the first necessity is obviated by erecting in the clear and at the optimum height, while the second is taken care of by observing the recommended feeder length, which in itself is a matching section. To conclude, thanks are due to G4ZU for his helpful advice, and to those of the locals who gave generously of their time in carrying out tests: G2HNO, G3BCI, G3BQR and G3JLH.

NEW GPO CABLE FOR SCOTTISH TV

The Post Office has played a major part in bringing alternative television to Scotland by installing the longest vision link in the whole of the Independent Television network, *viz.*, from Manchester *via* Glasgow to Black Hill, Lanarkshire, a distance of 237 miles. This link was opened on August 31. The circuit is routed *via* Post Office switching centres at Manchester, Glasgow, and Kirk o'Shotts. Throughout the whole route the line plant and buildings are shared between the television and the normal Post Office telephone services.

This new link is carried in coaxial cables, which also contain a considerable number of telephone circuits. Amplifiers housed in wayside repeater stations are located at six-mile intervals throughout the cable in both directions, and most components are provided in duplicate to minimise fault liability. Power for the amplifiers is transmitted from intermediate stations up to 70 miles apart and located in the large towns *en route*. In addition to the television link, circuits are also provided for music, control and supervision.

Multi-Purpose Dip Meter

COMBINED ABSORPTION WAVEMETER, CALIBRATED GDO AND RF INDICATOR

M. W. KIRBY

This is a neat application of the GDO principle, the particular design discussed here also having a very wide frequency coverage. It is the sort of work-bench tool for which there are endless uses and applications.—Editor.

SOME form of absorption wavemeter is often required in constructional work. When this can be combined with a low-power signal source and provision can be made for it to check on the value of inductances, the instrument will obviously form a very useful addition to the bench equipment of the average station. The unit described here has these features and has proved of great value during modifications and constructional work undertaken by the writer over a long period. It can be made at very low cost from parts which are in all probability already in the spares box.

The circuit is shown in Fig. 1 and, as can be seen, consists of a 6J6 connected as a cathode-coupled oscillator. The valve used can actually be any in the double-triode category which have been designed to work at radio frequencies. The component values are not critical and no trouble should be experienced in obtaining oscillation well past 144 mc. With suitable chokes in the heater leads of the 6J6 and paying attention to lay-out the oscillator will function up to 400 mc.

In the other direction, the circuit as shown will only work as a radio frequency generator down to about 40 kc. If it will be required to deliver audio power the signal take-off condenser C2 should be increased to ·01 μF for LF and changed back to 15 μμF at RF—*see* Fig. 2. Alternatively, a separate socket can be wired for audio power only. Should the output be wanted for use with an oscilloscope, R1 should be made variable and left undecoupled, as this provides control over the feedback and hence the quality of the waveform. The values of R2 and R3 are a compromise between good meter sensitivity and reasonably linear input over each band. Above 50 mc, the introduction of the loop does upset the calibration and it should not be used at these frequencies; the coil can be lightly coupled to the inductance to be measured directly. The switch S1 is used to change the meter position from the anode circuit, when it is used as a dip meter, to the diode circuit when the instrument functions as an absorption wavemeter. By placing a close-circuit jack J in series with the diode, it is possible to operate the unit as a modulation monitor (amplitude only) by plugging in phones and switching to the wavemeter position.

The unit is constructed in a die-cast case measuring 7 in. × 4 in. × 2 in., which allows

Table of Values

Fig. 1. Circuit of the Combination Instrument

C1	= 500 μμF (*see text*)	P1	= 1-megohm pot'meter
C2	= 15 μμF	S1	= DPDT toggle
C3, C5	= .01 μF, 250v.	M	= 0-5 mA m/c meter
C4	= .002 μF, mica	D	= Brimar GD4
C6	= 50 μμF, ceramic	V	= 6J6, 12AT7, 6SN7, etc.
R1	= 2,000 ohms, 1-w.		
R2,R3, R4	= 47,000 ohms, 1-w.		

COIL DATA

100 mc	= L1, 2 turns 16 SWG, ¼-in. diam. by ¼-in. long. L2 not used.
50 mc	= L1, 2 turns 20 SWG, ¼-in. diam. by ¼-in. long. L2 is L1 tapped ½-turn from earthy end.
30-6.0 mc	= L1, 8 turns 24 SWG, double-spaced on ¼-in. diam. L2, 1½ turns inter-wound at earthy end L1.
5.6-1.5 mc	= L1, 20 turns 24 SWG, single-spaced on ¼-in. diam. L2, 3 turns at earthy end L1.

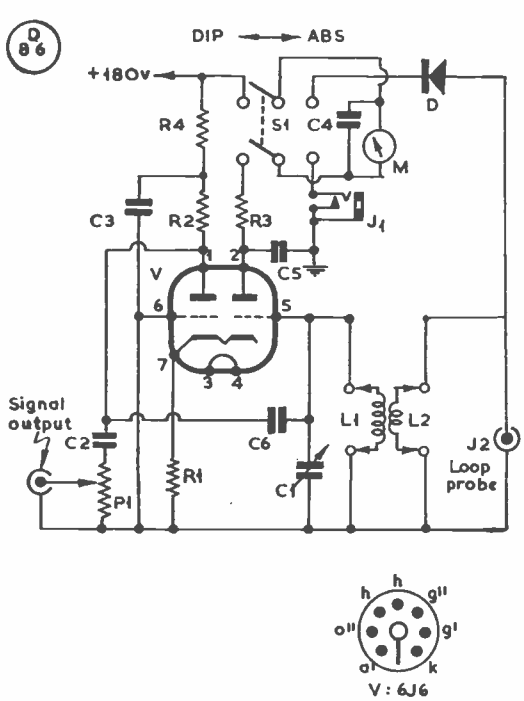


Fig. 1. Circuit of the wide-range multi-purpose dip meter, which can be used in several different ways, as described in the text. Depending upon the coverage required, some possible modifications are shown in Figs. 2 and 3.

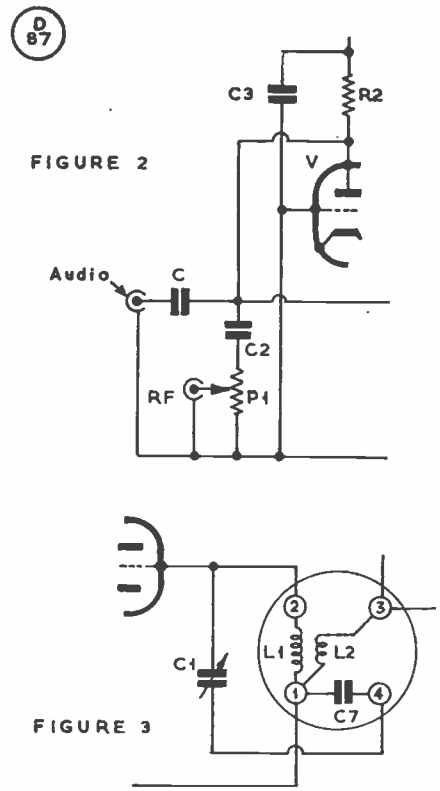


FIGURE 2

FIGURE 3

Fig. 2. This circuit will give constant LF output but if the attenuator is required, it is better to use the one socket for RF and LF outputs and switch the condensers. Fig. 3. For the VHF coverage, it will be necessary to use C7, connected to be in series with C1 when the VHF coil is plugged in. On the HF bands, pins 1 and 4 on the coil formers are shorted, and C7 omitted. C in Fig. 2 can be ·01 μF.

ample room for the components. The condenser C1 should be of good quality, with an adequate slow-motion dial fitted. The valve is mounted on a small bracket screwed to the side of the chassis, in the most convenient position. Apart from the usual precautions the circuit can be freely adapted to suit the constructor's requirements. The box has three fixed leads coming out of it to the power supply ; as some excellent midget rectifiers are available, giving 20 mA, with the use of a midget heater transformer it would be quite possible to build the power supply into the case, making it a very compact instrument indeed. The power supply requirements are 10 mA at 180v. and 6·3v. at an amperage to suit the valve used.

The Probe

The stability of the oscillator is very good, but using the loop probe does shift the frequency slightly ; however, it is insufficient to justify a more elaborate coupling being provided to overcome this. The probe is made from about a yard of TV type co-ax with a jack plug at one end. The other end has the outer braid removed for about 9 in. The inner lead is then curled so that it makes a two-turn coil and is soldered to the outer braid ; twine is bound round the coils to hold them in place.

The coil socket is mounted on the end of the case at one side, the coils being wound upon plug-in formers. When finished the coils should be well varnished so that the turns will not move and upset calibration.

If no coil is plugged into the socket and the switch S1 is in the " absorption " position, it will be found that the meter will indicate RF in the same way as a loop bulb, irrespective of frequency ; the pick-up is obtained by the loop probe.

As the capacity of C1 is large at high frequencies it will be found that the oscillator will only work at the high frequency end of the ranges above 30 mc. If this is objected to, the fourth pin on the coil former could be used to bring in a series condenser to reduce the effective capacity of C1 on these ranges—*see* Fig. 3.

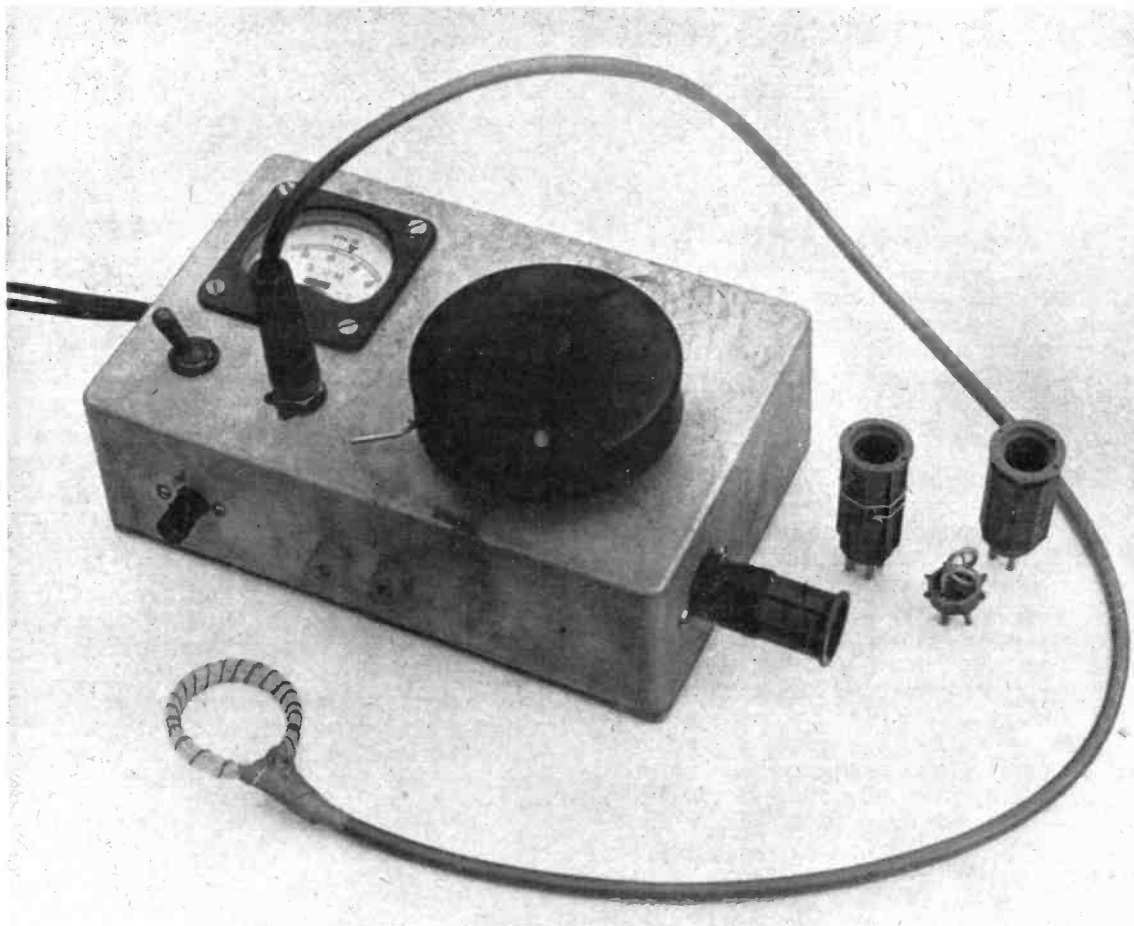
Calibration

The best way of calibrating the meter if a good signal generator is not available is to beat the oscillator output with stations of known frequency on the station receiver. By taking both fundamentals and harmonics, a very fair graph can be drawn for each coil and the scale marked off from the graph. If the accuracy of the receiver is good the simpler method of obtaining zero-beat with the BFO on can be used, in which case the unit can be calibrated in the space of a few minutes. If a commercial signal generator is available beating the oscillator with the signal generator on the receiver is the best way of getting good calibration accuracy.

Many uses will be found for this Meter about the station and, in view of its low cost and easy adaptability, is well worth the time spent on construction. The versatility and ease of operation will be appreciated by those who build it ; in fact, it is an instrument that could be used to advantage at all stations where the cost of equipment has to be considered.

BBC TRANSMITTERS IN THE ISLE OF MAN

The BBC announces that a VHF transmitter to carry the Northern Home Service is to be installed on the same site as the permanent television station at Carnane in the Isle of Man. It is hoped that the transmitter will be ready for service early next year.



The completed instrument, as described in the text. By using a large variable capacity, with suitable coil values, a wide frequency range can be covered—from Top Band to VHF. The probe is very convenient for many purposes and, if used carefully, need not affect calibration unduly in the HF range. With good a slow-motion drive, adequate calibration accuracy for all practical purposes can be obtained by beating against the station receiver, each coil then being separately graphed on the dial readings as noted. Though the meter shown is one of the well-known " surplus " patterns scaled in volts, it is actually used here as a low-reading milliammeter.

GREAT CABLE-LAYING FEAT

When the American Telephone and Telegraph Company gained the contract to link the Hawaiian Islands to San Francisco, California, by cable, the only ship capable of doing the job was the British Post Office ocean cable-layer *Monarch*, which last year laid the Atlantic telephone cable from Oban to Clarenville, Newfoundland. *Monarch* has just completed her Pacific assignment, having laid some 4,000 miles of cable at a maximum depth of 3,000 fathoms. The whole project cost £13m. and the cable itself is about 150 miles longer than the one laid on the Atlantic route.

NEW TRANSISTOR FACTORY

Semiconductors, Ltd., announce the construction of a specially designed factory on the Cheney Manor Estate, Swindon, solely for the production of transistors. Special air-conditioned equipment will regulate temperature, humidity and dust concentration in the main production areas, to ensure that the manufactured transistors will be free from impurities which could reduce reliability or cause deviation from the designed electrical characteristics.

It is claimed that the Philco electro-chemical techniques to be used in manufacture give unusually close control of tolerances and permit automatic control and transfer methods, enabling the production of high performance transistors of outstanding reliability at a reasonable cost.

Production at the new factory is expected to start during 1958 with the manufacture of the HF surface barrier and micro-alloy types of transistors for service up to 40 mc.

Simple Two-Band Cubical Quad

FOR TEN AND FIFTEEN METRES

C. TEALE (G3JYB)

Given the main support and the feeder lines, a beam like the one described here should not cost more than about 30s. In terms of performance, it could mean all the difference between working and not working the DX on 10 and 15 metres.—Editor.

THE problems here at G3JYB are the same as those of many amateurs: Living in a built-up area and having only a small back garden. Fortunately, a 132 ft. wire across some waste ground is possible. This wire runs north-and-south, and using it on the higher frequencies gave good results on CW — but when it came to phone, conditions had to be good and contacts outside Europe were only made when few other G's were on the air. A beam seemed to be the obvious answer, but the over-hang of a conventional beam, even a 10-metre affair, practically ruled this out. The garden is about 25 ft. by 25 ft. The Cubical Quad seemed to be the solution. It was decided to try a 10-and-15 metre version.

Materials

A dozen 10 ft. bamboos were purchased from the local gardening shop and 1 ft. 9 in. sawn off the best eight. (Only eight are needed, but some of them may be badly warped or split, unless they can be carefully selected. If there are any accidents in the construction, one may be glad of the spares.) A six-foot length of 2 in. x 2 in. timber fairly free from knots was obtained, and 8 large shelf-brackets of the sort sold by any ironmonger, or the local Woolworth's.

As it was intended to use a 2 in. scaffold pole for the mast, a suitable U-bolt was also required. A 300 ft. reel of aerial wire, the thin braided type sold as "surplus" at about 3s. 6d., completed the purchases.

The 6 ft. wooden bar was drilled diagonally in the centre to take the U-bolt. A little of the wood was carved away to provide a better bearing against the 2 in. mast. One or two extra holes were put through each of the brackets so that the bamboo poles could be lashed to them. Four brackets were then screwed on to each end of the bar. *See* sketch.

Assembly

The aerials were measured out as accurately as possible, taking great care not to get any kinks in the wire. The tie points at the bamboo ends were indicated by a few turns of insulation tape.

The cross-bar was next fastened to a 10 ft. pole. The free end of the pole was laid on a pair of steps and one end of the cross-bar on the ground. This cocked the end of the cross-piece into the air, but within reach. The bamboos were then lashed on to the upper brackets with twine, insulating tape being wrapped round to complete the job. The assembly was reversed to complete the fixing of the remaining bamboos. The aerial wire was attached to the upper set of bamboos and then, with the assembly held in a vertical position with temporary guys, the aerials were fixed to the other bamboo spreaders. Some adjustment of the relative positions will probably be found necessary at this stage. The ends of the wires were temporarily tied together with string. The tuning stubs—at 3 in. separation between the wires—were soldered to the reflector sections and held taut by nylon thread attached to the cross-bar. For 10 metres, the stub is 30 in. long, and for 15 metres it is 42 in.

Tuning Up

If a grid dip oscillator is available tune the station receiver to 21·1 mc (28·3 mc for 10 metres) and arrange for the beat from the GDO to be audible whilst working in the garden. Temporarily solder the ends of the aerial together and form a small loop to couple to the GDO. Dip the GDO and check whether it is high or low according to where the beat is heard in the receiver. If high in frequency, add a little more wire; conversely, if low, remove a few inches. Do this until the wire loop resonates at approximately the same frequency as that to which the receiver is tuned. Repeat for the other aerial.

If no GDO is available then all you can do is to measure accurately and hope that it will be near enough.

Attach the two feeder lines and fasten them to the mast a little higher up to take the strain off the joints.

Stub Adjustment

Couple the system to the transmitter and with the aid of a friend holding a field-strength meter (or crystal-diode absorption indicator)

move the short-circuiting link up and down the tuning stub until maximum forward gain is achieved. Then solder a wire bridge permanently across these points. (While varying the tap with RF power on, wear dry gloves.) The adjustment of the stubs is fairly "flat." If you are more interested in back-to-front ratio than in forward gain, then the tuning bridge on the stub can be adjusted for this, but at the expense of forward gain. The procedure is, of course, the same for both aerial sections.

At G3JYB, 72-ohm coax is used for both the 10- and 15-metre aerials; but on 21 mc, a better match would be obtained with 52-ohm feeder. Though the standing-wave ratio has not been measured, a check with an impedance matching bridge suggests that the SWR is not too high. The gain of the system appears to be 8-10 dB, which compares favourably with a 3-element parasitic beam for either band.

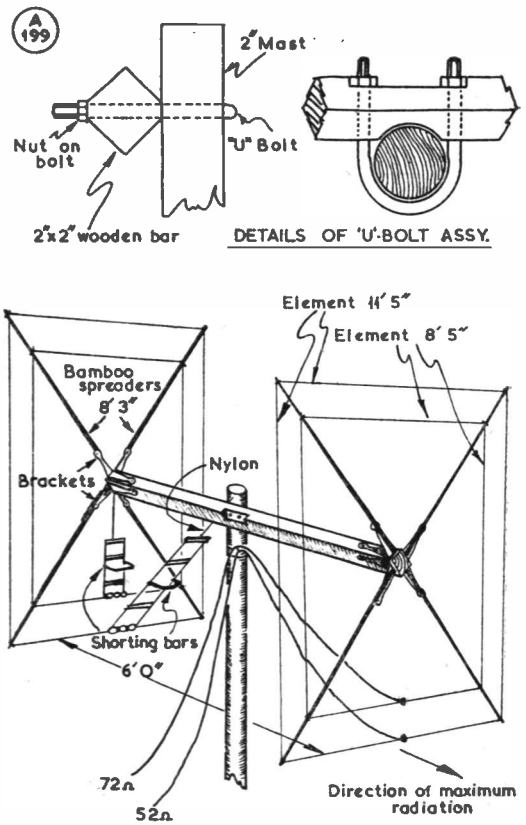
The final height of the erection is about 30 ft., the 10-ft. stick on which the beam itself is mounted being secured to a 20-ft. pole, with one set of guys 10 ft. down from the beam cross-bar. The assembly as described here has withstood several Force 8 gales, and at all times is fully exposed to the south-west. The fact that it has considerable resilience under gale conditions is probably helpful rather than otherwise, though it seems evident that it might have been better to have used two sets of guys, with the upper ones nearer the beam head.

Band-width

Using such thin wire for the aerial sections means that the system tends to be more frequency-conscious than it would be with heavier, tubular elements—but then, one cannot have it all ways! The effective frequency coverage on Ten appears to be 500 kc or so about the resonant frequency, and on 15 metres it is roughly half this. These limits give ample coverage of the phone or CW areas of the two bands. Tune the system on the centre-frequency of the band area you wish to use.

Results

Running 80 watts input, these have been beyond expectation, with such comments as: "*Yours was the loudest of the bunch calling me.*" "*A most outstanding signal,*" and "*The best from Europe right now.*" During a few weeks' operation on 15 metres (Ten still enjoying its summer vacation when this is being written) S9+ reports from Australia, South Africa, and North and South America have



General layout of the Two-Band Cubical Quad, as described in his article by G3JYB. For 10 metres the tuning stub is 30 ins. long, and for 15 metres it is 42 ins., the wire separation in each case being about 3 ins., though this is not critical. These dimensions allow ample "play" on the tuning bridge; the stubs serve to resonate the two sections of the system, and to control back-to-front ratio as against forward gain on each band. The mechanical stability of the array as shown here is quite satisfactory under gale conditions, though more staying of the main supporting mast would be desirable.

been quite usual. Now that 10 metres is opening again, it is hoped to be able to give the 28 mc section of this very simple Cubical Quad a good run through.

For those interested in the rotary feature of the array, the main mast is mounted so that it rotates about the base. The (one) set of guys at the 20-ft. position is taken to a wheel bearing assembly acquired from an old car. A bicycle chain main wheel has its centre cut out and two brackets secure it firmly to the mast. A small 24v. DC motor with adequate reduction gearing (actually, an aircraft gill control unit) is fitted with a cycle chain-driven sprocket. The whole is accurately lined up, and the chain is run in aluminium angle to keep it aligned and protected from the weather. Stops are fitted to prevent windmilling, and the beam is kept head-to-wind when it is blowing hard.

Capacity Feed for the Mobile Whip

A NEW METHOD OF AERIAL COUPLING

J. M. OSBORNE, M.A. (G3HMO)

This article will be of considerable interest to /M operators not only because it suggests a more efficient method of feeding the radiating system, but also because it shows that the possibilities for experimental work with mobile aerials have by no means been exhausted. As before, the treatment is practical, and the results shown are based upon comparative tests. The principle of this method of feed depends upon the fact that, in a strong RF field, coupling at high impedance can be obtained through a very small capacity, which can easily be made variable.—Editor.

IN the June, 1956, issue of *Short Wave Magazine* the general subject of the design and coupling of whip aerials for Top Band mobile operation was considered in some detail — the discussion was based upon an experimental investigation, carried out in collaboration with G6FO, to establish some data for designing, resonating and feeding whip aerials of reasonable dimensions for the average car.

At the conclusion of that article, it was remarked that several other promising possibilities remained to be explored, as regards the best way of actually feeding power to the aerial. One of the most attractive of these — capacity feed, with the total elimination of the PA tuned circuit — has now been tried, with very encouraging and significant results. The notes following discuss what may be, to some readers, an entirely new method of feeding RF into a resonant system for mobile operation; on the other hand, it is fully appreciated that others who have experimented with whip systems may have arrived at the same conclusions, and in the same way.

Basic Considerations

It is already well established, by experiment and practical result, that for mobile work on the LF bands, only the aerial above car-roof level is fully effective. That is to say, at best the whip section and its loading coil should be on the roof of the car; if bumper mounting is used, then the coil must appear above roof level, with the section below the coil regarded as a mechanical support only. Furthermore, the higher the loading coil itself can be placed up the whip section, the more effective the radiation.

The mobile radiating system in use for G3HMO/M conforms to these principles and consists of a roof-mounted loading coil with a four-foot whip, near the top of which is a single three-foot horizontal section, centred on the whip, which serves as a capacity-hat. This aerial gives results directly comparable with a bumper-mounted 12-ft. whip, but is of course much smaller, more compact, and safer mechanically.

Capacity Feed System

The foregoing is a necessary preamble because the coupling system now evolved is not applicable to all types of loaded whips and methods of mounting.

Basically, the idea now is to capacity-couple the loading coil itself direct to the PA anode without any pi-network or other RF linking system. The original Top Band Talking Box (*Short Wave Magazine*, October, 1956) thus modified results in an RF transmission system with no coils or tuning condensers, so the potentialities for real miniaturisation become apparent. The losses inherent in a conventional tank circuit are also circumvented — losses are, however, not entirely eliminated, because there must still be an RF feed lead from the PA into the aerial.

In comparison with low-impedance feed from a tuned circuit into the base of the loading coil, the disadvantage of this system is that in the RF sense the feed wire is "hot" (very hot), and so must be kept short, with minimum capacity coupling to chassis *en route* to the resonating coil. In some installations, this may involve constructional difficulties. The best arrangement, obviously, is to be able to mount the transmitter in the roof immediately below the support for the loading coil and its whip section, as suggested in Fig. 1 (A).

The coupling capacity C1 consists simply of an open loop of wire (*not* a complete circle or "shorted turn") placed inside the coil former, and held in position partly by side-friction and partly by the stiffness of the wire itself; this coupling capacity links, in the electrical sense, to the coil wound on the outside of the former. In practice, ample coupling is obtained, the trick being to find the right place at which to settle the coupling loop. For the experiments, the latter was mounted on a piece of thick wire, pushed up and down inside the

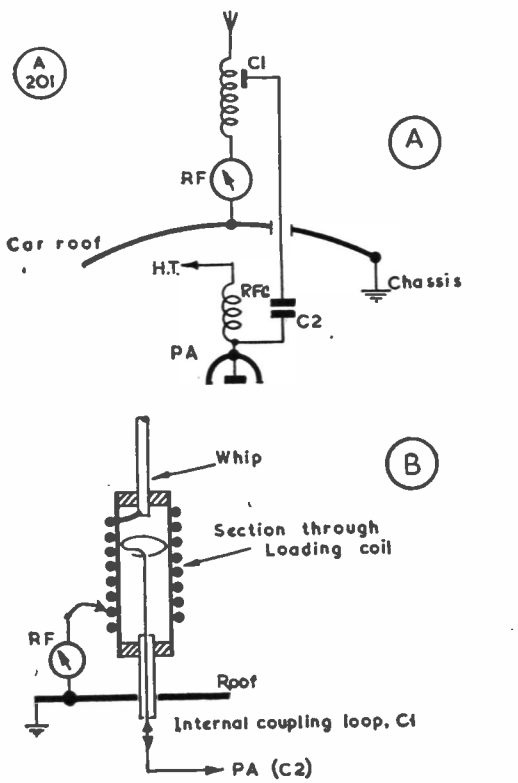


Fig. 1. Sketch (A) shows the electrical layout of the capacity-feed system, as described in the article; there is no PA tank tuning circuit in the accepted sense, the resonating coil in the whip section acting both as PA tuned circuit and part of the radiating element. Capacity C1 can be very small, formed by a single open-loop, as shown in (B). This is moved up and down inside the loading coil former until the point of optimum coupling is achieved, as explained in the text. The system is at resonance, both as regards "PA tuning" and "aerial peaking," when maximum possible RF current reading is obtained in the ammeter; this can then be removed.

coil mounting, the loop and plate connections being made to the central length of the wire. The bottom of the loading coil is earthed directly to the chassis, as in Fig. 1 (A).

Thus, the PA is capacity-coupled to a self-resonant circuit which is at once the tank coil and an essential part of the radiating system.

Originally, the arrangement used with the Talking Box for G3HMO/M was a lead from the base of the loading coil, through the inside of the car, to the output side of the pi-network in the transmitter. This low-impedance lead can be of any length, and is quite "cold" to RF — it does not even need to be screened: it is simply an RF pipe. To vary the resonant frequency of the aerial system separately from the transmitter tuning, a suitable selection of taps is provided on the loading coil. To find the right tap is of vital importance; it is the one which gives maximum aerial current out of the pi-coupler, with very flat tuning on the condenser on the output side of the pi-coupler. This is the layout of the old system.

Adjustment

In the new method of coupling, as shown in Fig. 1 (A), (B), the RF ammeter is connected in the earthy lead from the bottom of the same loading coil as used before. Again, maximum RF indicates maximum radiation. The capacity coupling alters, slightly, the original resonant frequency of the loading coil, and the bottom tap must be adjusted accordingly. The procedure for setting up is as follows:

First, a tap which looks as if it should be a good starting point is selected, more or less at random. The PA feed lead C1 is then moved up and down inside the coil until maximum RF is indicated (with the operator's hand removed). The procedure is repeated for other taps, above and below the one first selected, until the maximum obtainable RF is shown on the ammeter. It is important to note that this method of adjustment enables optimum matching *and* correct resonance to be achieved simultaneously. When completed, the RF meter can be removed and its tap lead well bonded to chassis.

In the G3HMO/M set-up, the "area of influence" of the coupling loop C1 is found to be between one-third and two-thirds up the coil from the earthy end. The best RF indication obtained is about 0·25 to ·30 amps. with a 5-watt carrier and a 4 ft. whip section. These figures are mentioned for guidance only; your readings may well be quite different.

Results

So far, it has been found that this method of coupling is at least as effective as the old arrangement, as described in June, 1956, with the advantage, potentially, of a much neater and more compact installation.

A new transmitter is envisaged, made to fix on the roof immediately under the aerial, built in a small and shallow "cigar-box" chassis, using horizontal valve mounting, and involving no tuning coils or condensers whatever; since the drive can be CC, frequency variation will be by change of crystal, controlled by switching, which will also select the appropriate coil taps, from the earthy end.

Some Further Points

For car owners who do not relish making holes in the roof because of the possible effect on re-sale value, the principle could be applied to a bumper-mounted whip by the method

shown in Fig. 2. However, this has not been tested, and is thrown out only as an idea — it is obviously of some experimental interest, particularly with a crystal-controlled installation. The problem would be to avoid losses off the PA coupling lead to the loop capacity.

A complicating factor where roof-mounting is involved is when the roof of the car is made not of metal but of some composition material in the plastic category; even then, however, the principles can be adhered to by making an artificial base for the aerial, using thin wires run down inside the car from the mounting point and earthed at their ends to the main frame. The result would be analogous to an earth-mat, and would enable the ground-plane characteristic of the system to be retained, even with the aerial on the composition roof. These wires need not be obtrusive if coloured plastic-covered types are used, run in with the piping of the interior decoration.

Finally, for the information of those who do make holes and then want to blank them off again, neat rubber stops, similar in fitting to grommets, are available very cheaply in many sizes under the trade-name of "Tewel," and are stocked by most good garages.

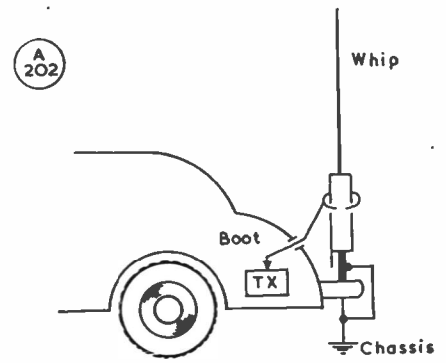


Fig. 2. A possible alternative coupling arrangement when the system is bumper- instead of roof-mounted. As explained in the text, this method has not actually been tested.

ESSEX MOBILE RALLY

MATCHING GREEN,
SUNDAY, SEPTEMBER 1st, 1957

ORGANISED by the Harlow and District Radio Society, this was held on the first day of September in rather cold weather — nevertheless, a large attendance was recorded, no less than 45 mobile aerials being counted in the car park, with 83 call-signs in the visitors' book; it is estimated that, in the course of the meeting, something like 200 cars actually visited the Rally ground.

Two talk-in stations were established—G3ERN/P for 160-80 and G3JMA/P for two metres—and they were kept busy from 10.00 a.m. to 6.00 p.m. Matching Green is a disused R.A.F. airfield with an accessible perimeter track; one of the old Nissen huts (a familiar and depressing feature of these war-time sites) was used for the reception of visitors, the equipment display and the ATV demonstration, and tents were set up for the mobile-control stations. Temporary power was brought in from the farm nearby, and at first there was some consternation when it was found that only about 90 volts could be persuaded to fall out of the end of the line—however, with so many willing "fixers" at hand, it did not take long to put that right. But it did complicate the arrangements for heating the tea urns.

The commercial equipment display, by K.W. Electronics, Ltd., with G5KW himself in charge, aroused considerable interest, and was a good idea from the point of view both of the visitors and the firm. The other attraction was the amateur TV demonstration, with G3KOK/T on closed circuit with his own camera, and live transmissions from G2WJ/T a few miles away; the picture quality was excellent. The ATV team also included G2DUS/T, G3CVO/T and G8PY/T, of "Matilda II" fame (*see* p.297, August SHORT WAVE MAGAZINE). With all the experience they have now had, the B.A.T.C. chaps have got the business of giving public demonstrations just about buttoned — and a very good show they put on, too.

Towards the end of the afternoon, the usual raffle was drawn, out of which came some most attractive prizes, including crystal microphones—so somebody was lucky!

As always, some very fine mobile installations were on view; of particular interest were the *air-spaced* loading coils shown by G2CDN/M and G3ENG/M, suitable for 7-28 mc operation, while G3WW/M had his all-band (80-10 metre) American "Master Mobile" coil; this is carried round carefully protected by a (lady's) stocking.

Including a very good attendance of mobiles from the London and Home Counties area, visitors to the Matching Green Rally were welcomed from Birmingham, Leicester, Maidstone and York. Traffic-control and sign-posting arrangements had been made beforehand with the local police and the motoring organisations, and the route from the village to the airfield site had been well marked for those who, not being mobileers themselves, could not be talked in. As is usual on these occasions, there was a great deal of /M activity, both before the Rally on the way there, and afterwards as those present dispersed on their various ways homeward.

The Harlow and District Radio Society (hon. secretary: H. I. Wright, Rest Harrow, Hart Road, Harlow, Essex) are to be congratulated on having added one more to the growing list of successful Mobile Rally occasions — it was just unfortunate that the weather was not a little more friendly to them.

Noise Limiter for the CR-100

SERIES TYPE, USING CRYSTAL DIODE

T. WINCHCOMBE (G3BCW)

THE CR-100, now on the market in large numbers at reduced prices, is a very popular amateur-band receiver. Various possible modifications spring to mind (many of which call for extensive rebuilding), but the noise-limiter described here is easily incorporated. It works very effectively to reduce pulse interference (ignition, Loran, Gee and similar noises) to a low level. Few additional components are required, and these are neatly accommodated on the existing group board in the screening box associated with the detector and BFO stages of the receiver.

The limiter is of the series diode, self adjusting type. The clipping level is controlled by the potential developed across C112, which in turn depends upon the signal level. Noise peaks cut off the diode and so are not passed into the AF stages. On the panel, the limiter on/off switch can be positioned midway between the AF gain control and the "operation" switch, level with the mains supply switch. The layout of the other components is as shown in the diagram. Care must be taken that the screening box can be replaced without touching any components.

Modification Detail

The original C97 must be taken out and the connections to tags 3 and 4 removed. The earth wire, which previously went to tag 4, also goes to C95 and R31 and must be re-routed; then join tags 4 and 5. R25 must be replaced by a 220,000-ohm resistor, and two similar resistors (R58 and R59) wired in series between tags 1 and 3. C112 is connected between tag 4 and the junction of R58 and R59. The germanium rectifier is wired between tags 2 and 3 (red end). Two screened leads are now run from tags 2 and 3 to the NL switch on the front panel. The original lead from C91 to tag 2 can be shortened and connected to the moving contact of the switch. This completes the modification.

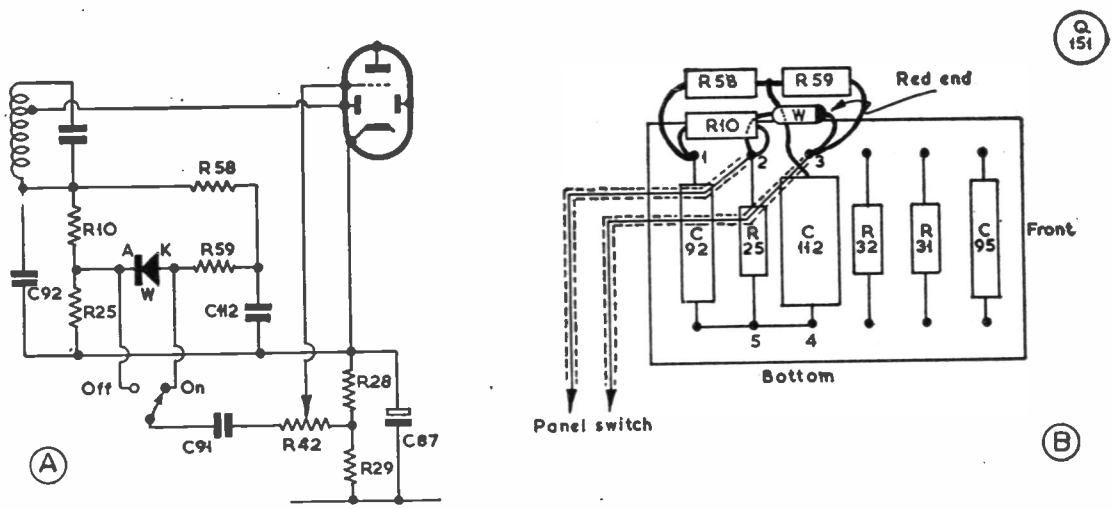
A miniature thermionic diode could be used if desired, but may produce perceptible hum besides being more difficult to accommodate in the available space.

Table of Values

Series Noise-Limiter for the CR-100

C91	= 0.1 μF, orig.	R29	= 10,000 ohms, orig
C92	= 100 μμF, orig.	R58, R59	= 220,000 ohms, addit.
C112	= 0.1 μF, new miniature	W	= GD5 or similar high reverse resistance crystal diode
R10	= 220,000 ohms orig.		
R25	= 220,000 ohms, new		
R28	= 1,200 ohms, orig.		

NOTE: Numbering as original (orig.); changes given as "new" or "additional" (addit.).



Circuit (sketch A) of the noise limiter for the CR-100, with component lettering to follow the makers' original marking, and incorporating the slight wiring changes involved. Sketch (B) shows how the items can be accommodated on the tag-board associated with the detector/BFO screening box. Those making the modification are advised to locate this part of the CR-100 circuit either from the manual or in the schematic diagram of the receiver.

Mobile Modulator Giving the Watts

PLENTY OF AUDIO WITH A SIMPLE CIRCUIT

D. I. WIGGANS (G3ATL)

IN the June issue of *Short Wave Magazine* some photographs and notes appeared on the mobile equipment operated by G3ATL/M in Consul NJU-888. This installation runs rather more power than is usual in /M working, a carrier input of about 75w. being available on 80 metres. To modulate this effectively, and to obtain full plate-and-screen control instead of screen only, a suitable modulator has been designed capable of giving about 35-40 watts of audio.

Because the circuitry is simple and results are so satisfactory, the details are given herewith for the information of those who may be interested in the problems of more power for mobile. Of course, higher inputs do involve bigger power supplies, but that can be taken care of if one provides a motor-generator ("genemotor") of the high-output variety, perhaps installing also an extra accumulator, along the lines suggested by G5CP in the July issue of the *Magazine*.

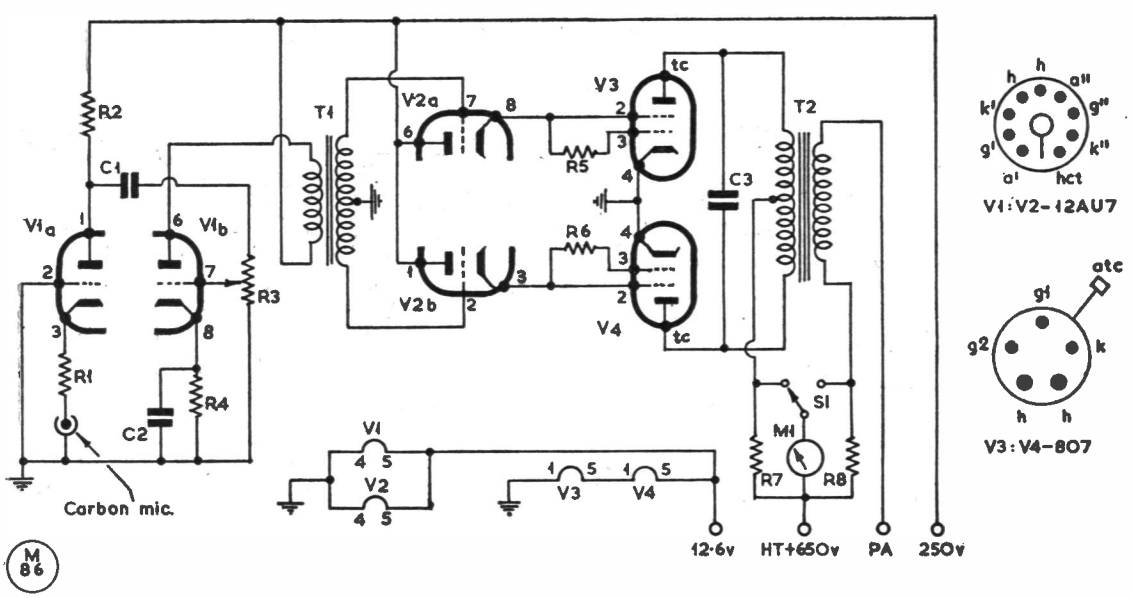
The modulator consists of a grounded-grid triode with the carbon microphone between the cathode resistor and ground, driving another triode which is transformer coupled *via* an SCR-522 modulation transformer; this drives on the grids of V2ab, the anodes of which are fed with HT at 250 volts, and the *cathodes* supply a *positive* ten volts to the *screens* of the 807's, the control grids of which are coupled to the 807 screens *via* 22,000 ohm resistors, R5, R6.

The plate-to-plate load of the modulator will be about 12,000 ohms, although the writer has experienced no detrimental effects with plate loads as low as 4,000 ohms. No change in anode impedance or bias is necessary with operating plate voltages over the range of 150 to 650 volts. For G3ATL/M, a supply of 650 volts is obtained from the genemotor, which draws 26 amps from the 12-volt car battery in the Consul. The static plate current under no-speech conditions is 30 mA and this rises

Table of Values

Circuit of the 807 Mobile Modulator

C1, C2	= .001 μF	T1	= SCR-522 mod. xformer
C2	= 4 μF, 50v.	T2	= TA-12 mod. xformer
R1	= 1,000 ohms	M1	= 0-300 mA, m/c
R2	= 47,000 ohms	S1	= SPDT toggle
R3	= 500,000-ohm pot'meter	V1, V2	= 12AU7
R4	= 3,300 ohms	V3, V4	= 807
R5, R6	= 22,000 ohms		
R7, R8	= 10 ohms		



Circuit of the four-stage 35-watt speech amplifier/modulator described by G3ATL, for mobile operation. If the carbon microphone is a good one, quality should be adequate. The output transformer T2, from a TA-12 transmitter, is found to be satisfactory, though the matching is not accurate; it might be better to use something like a UM1 in this position, to get a better match between modulator and PA.

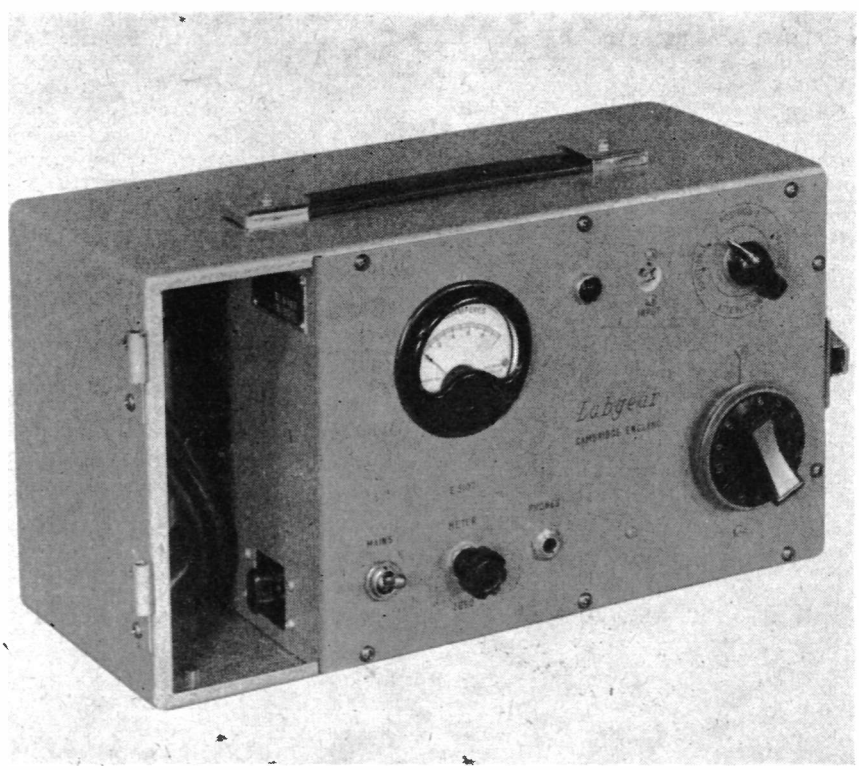
to a maximum of 120 mA on voice peaks. The modulator is fully capable of 100% control on carriers up to 75 watts, and has the advantages of being quite compact and comparatively low on current drain. No special layout of components is necessary, but it is advisable to place the gain control as near as possible to V1ab and use screened leads.

MICROWAVE RADIO LINKS FOR TV

The transportable type of outside-broadcast microwave equipment, used by the G.P.O. as a link for the BBC's Cumberland TV service, is expected to be replaced by a permanent station with new equipment in 1958. Television programmes are distributed from the studios to the transmitting stations throughout the country over a network of cable and radio-relay links operated by the Post Office. Sometimes these links have to be provided at short notice, and one example is the Cumberland service. This economical method of relaying programme material uses the radiated signal from a television transmitter in one area, receives it at the fringe of the service area. and re-transmits it to feed a transmitter in another area. The signal broadcast by the Pontop Pike TV transmitter is at present received 28 miles away at a temporary station in the Pennines, near Haltwhistle. From there it is relayed 34 miles over a Post Office microwave link to the BBC station at Sandale Fell.

NORWICH TELEVISION STATION

The BBC announces that on December 1st the power of the TV transmitter at Norwich will be increased and will be put up further, to full power, in the spring or early summer of 1958. The permanent aerial, mounted on a 500-foot mast, was brought into service a year ago to replace the earlier temporary aerial, and the permanent transmitters had been installed by that time. The station has, however, continued to operate on reduced power in order to avoid interference with the Belgian station at Liege, which, under international agreement, has a right to protection against such interference.



Apart from specialised amateur-band equipment, Labgear Ltd. also manufacture a wide range of commercial apparatus and test gear. This instrument is their Type E. 5107 Signal Strength Meter for the installation and servicing of TV aerials. It covers all channels and uses the standard 13-channel TV tuner. A detachable plug-in meter is provided to enable remote indication to be given, through a long extension lead, so that a TV aerial set-up can be orientated correctly. Each of these instruments is individually hand-calibrated and the sensitivity is such that it can be effectively used in fringe areas.

S.B.A.C. SHOW—FARNBOROUGH

The annual Society of British Aircraft Constructors' Show at the Royal Aircraft Establishment's airfield at Farnborough is not only a magnificent display of flying, but also a most important radionics exhibition —this is a large part of the static display. Broadly speaking, modern aviation—both now, and even more so in the future—depends upon the correct application of radionics, in all its numerous specialist branches of radar, telecommunications, electronic control and telemetering. Many large and small firms in the radionics industry are now directly interested in aviation electronics, and between them are making a very important contribution to the technical progress of the British aviation industry. At this year's "Farnborough," during September 2-8, no less than 52 manufacturers of radionics equipment were represented in the static enclosure, out of a total of some 310 exhibitors.

THE TWELFTH OCCASION

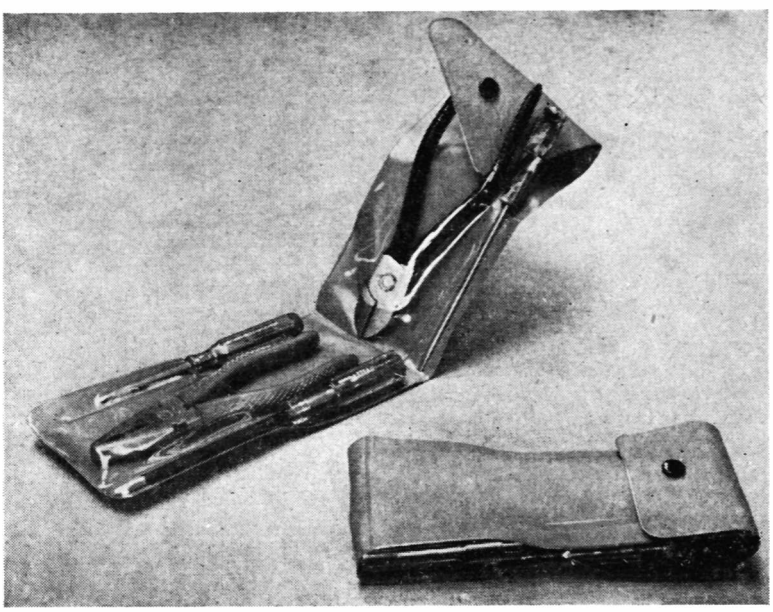
Elsewhere in this issue appear the rules for our annual Club Transmitting Contest on Top Band, the 12th of the series. It will be noted that single-operator, *i.e.* non-Club, stations can make a contribution to the fun, since contacts with them score one point, against three for an inter-Club QSO. It often happens that the winning positions turn upon the number of one-point stations that can be worked, so it is hoped that as many CW operators as possible will appear on Top Band during the week-end afternoons of November 16/17 and 23/24. They will find the Clubs locked in combat, calling and signing "MCC" (*Magazine Club Contest*). It is particularly requested that non-Club stations refrain from calling "MCC" themselves, since this group is used exclusively to identify Club stations to one another. Check logs would be appreciated from those who care to send them in. and will be credited.

BREACH OF REGULATIONS

Quite recently, the wife of a Midlands amateur was prosecuted by the Post Office for operating her husband's station—not only when he was in control, but also in his absence. The G.P.O. representative in court had no difficulty in proving his case, which was not denied by the amateur concerned. The station had not been used in any blatant way by his XYL, she having learnt to operate it on phone merely for the purpose of talking to her family, in Gibraltar. The magistrates accepted the G.P.O. evidence, and discharged the defendant with a warning. And this case is also a warning to those others who have not read Clause 2(c) of the Licence.

DX TELEVISION RECEPTION

From CN2AO, Tangier, we have had an interesting selection of photographs, taken directly off his TV receiver screen, of transmissions from a number of European TV transmitting stations, during May-August this year. All the prints show a good-quality picture, and generally CN2AO has been able to record TV from Belgium, Germany, Holland, Italy, Switzerland and the U.K. on Channels 2-4, using a French "Saba 644" receiver and an aerial system designed for him by G4ZU. Furthermore, CN2AO reports that other amateurs in Tangier and Casablanca are able to receive DX television. Incidentally, CN2AO/T is now on the air on the two-metre band, using an American R.C.A. TV camera.



This neat tool kit contains a mains tester, 6-in. pliers, 4-in. sleeved screwmaster, a utility screwdriver, and a pair of side-cutters. The kit is marketed by J. Stead & Co., Ltd., Manor Works, Cricket Inn Road, Sheffield, 2, and costs 23s. retail.

RADIO FOR THE FIESTA

ONE-DAY STATION AT A GARDEN PARTY

H. N. Kirk (G3JDK)

RECENTLY, a station signing G3JDK-G3KUH/A was heard on 21 mc phone — the result of a couple of weeks of hard work put in "after five"! The site was in the grounds of a Northern laboratory, the occasion being the annual garden party. The proposal was put to the organisers of the fête, who, whilst not quite knowing what it was all about, thought it might be a "good idea." This being so, G3JDK and G3KUH (both employed by the Laboratory) thought it a fine opportunity not only to prove that Amateur Radio meant something more than "building your own set from blueprints," but also to try out a different site as well. G3KUH had a partly completed transmitter, to which was added an LS50 PA (the LS50 is a German multi-purpose RF type), and ran it up to 25 watts without trouble—no bugs, no drift, so the first part was all right!

Rotary Beam

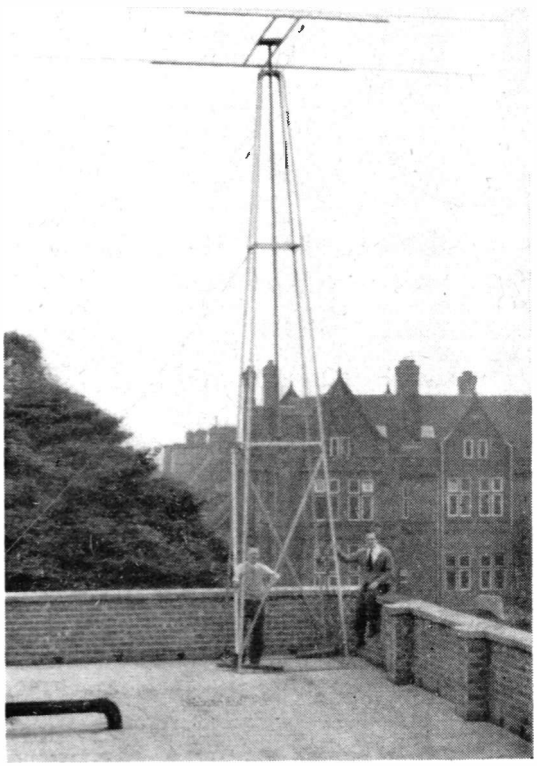
Then several 10-foot lengths of patent punched angle ("Handy Angle") were acquired, with a 20-foot 2-in. diameter builder's pole, a 2-in. diameter steel sphere (just like Holme Moss!), and lengths of ¾-in. aluminium angle for the radiators. Some cord and lots of hard work were added, and the result was a 30-foot self-supporting tower surmounted by a rotating two-element beam on 21 mc. The whole assembly was then hauled to the top of the 30-foot-high laboratory building, making a very imposing array indeed—so imposing, in fact, that our Director of Research remarked that "it added greatly to the scientific appearance of the building — perhaps it should be a permanent structure."

Coax feed was run down, the station assembled, and test calls put out. Result was *nil* until someone suggested it might work better with the modulator switched "on"! We tried again with the beam on Europe, and back came an SM—RS-59+ both ways. Having broken the ice, things went well thereafter, and several W's were raised with 5 and 9+ reports. All was well; we were ready for the big occasion.

The following day the gear was checked again, a "shack" built (a real shack, too, canvas stretched on wooden laths), and G3JDK-G3KUH retired to refresh themselves with lunch, the fête being in the afternoon. On returning to the site, we were aghast to find the station crowded by small boys, all turning dials and pulling switches at a terrifying rate; however, nothing was missing and everything still worked—G3JDK-G3KUH went on the air!

The Results

Surrounded by the amused, the sceptical, the scornful, the delighted, the amazed and the down-right disbelieving (who thought we had a tape recorder hidden away somewhere giving the replies),



The mast and its two-element beam for 15 metres, built by G3KUH (left) and G3JDK (right) for a one-day demonstration of the potency of Amateur Radio. The whole station, including the array and pylon shown here, was put together in a fortnight's work "after office hours." The pylon was built of patent punched steel angle ("Handy Angle") and the beam of angled aluminium strip, carried on a 20ft. pole supported on a 2-in. diameter steel ball. The designers of this impressive array, which gave them very good results for their demonstration (see text) describe its construction as rather like working in "Big Boy's Meccano"!

we raised and worked many W's, VE's, SVØ, CN2, a ship at sea who requested the "latest Test score," a VS2, and an I1, who couldn't grasp the reason for holding a party in a garden, especially in the rain (yes, it rained, of course!), and many other stations who helped to make our day. The day did end, of course, and sadly we dismantled the station, at the same time bemoaning conditions and "the ones that got away."

Results? Amateur Radio is safely established at these Laboratories (half the staff were going about their business for days after calling "CQ"!)—with a promise of QSL cards in colour sponsored by the company, and bottles of beer donated by The Boss for two very sore throats at the "inquest" afterwards. Shall we have a station next year? We certainly shall, bigger and better—we've just got to talk the Director of Research into that beam—say, 100 foot high—and permanent? We've got ten months to do it in, anyway!

DX COMMENTARY

L. H. THOMAS, M.B.E. (G6QB)

G3JZV

CALLS HEARD, WORKED and QSL'd

WE have another very mixed month to discuss. It has been a complex variety of solar flares, sunspots, auroral displays, dead bands, excellent conditions, first-class operating and what, for want of a better name, we have decided to call Klottery. Plenty of everything, including the latter, has ensured a high level of activity on the HF bands, although *Ten* continues to be disappointing for most of the time. However, it is about to wake up again, and has been showing life at times during the period.

There is so much to report, so much news and so much activity that we had better cut this usual preamble as short as possible and get on with the real business.

It is not often that the arrival of a new country, let alone a new Zone for most people, can be announced, so pride of place is given to the following item of hot news — it is almost too hot to hold!

Mongolia — and Zone 23!

On September 3, **JT1AA** came on the air from Ulan-Bator in the Mongolian People's Republic (Zone 23). He is a Czech named Ludvik (known as "Ludva") who used to be a member of the team at OK1KAA. Prior to his departure for Mongolia he was thoroughly briefed, primed and indoctrinated by OK1JX as to his duties and responsibilities as very rare DX — and also acquainted with all the troubles likely to beset him in that not very comfortable capacity!

He is now described as "a very good operator, only without real DX practical experience" (which is of the essence in a case like this).

Crystals available at JT1AA are on 7010, 7030, 14004, 14068 and 14094 kc. OK1MB and OK1JX will often be standing by to try to keep the frequency clear. A strict black-listing practice will be imposed; no station need expect a QSO or a QSL who calls JT1AA on his own frequency, neither need anyone employing any kind of "Spiv" tactics expect a result therefrom.

QSL policy will be "100 per cent. return," and will be dealt with by OK1JX, Box 69, Praha 1, Czecho-Slovakia. Skeds between JT1AA and OK1JX will sort out logging and QSL matters — and, needless to say, anyone trying to interrupt these skeds will occupy a favoured position on the black list. Further information will arrive later — meanwhile we have to thank OK1JX for this very detailed information — and *see* later.

While on the subject of Zone 23, it might be mentioned that VU2AX expected to be operating as AC4AX, and that AC4LP (sounding DX and probably genuine) has recently been heard by several correspondents. There used to be such a call, and he might be good.

DX Gossip

Having opened with this rather shattering item, we may as well continue with the stray notes and news on unusual DX before proceeding to the usual review of the bands.

OK1JX reports that another Czech amateur is now working from Damascus as YK1AT. He operates at the low end of Twenty, 400 watts, rough note but "swell fist"; usually 0500-0700 and 1400-1700 GMT.

Another interesting and rather mysterious one is reported by G3KWK (Doncaster), who worked HL5KAA, giving QTH as Phenyan and operator's name as Tan (XYL). There's no particular reason to suspect this one as a phoney, but at least we can say that no confirmations are yet available.

Activity from Laos has started

up again, with XW8AG very active on Fifteen and Twenty, and an occasional sign of XW8AB's return.

FL8AC has also shown up, as promised, from French Somaliland, and will lighten FL8AB's load considerably. Italian Somaliland has also come back into the activity lists with I5FL, who has been worked on Twenty phone by quite a number of the 'chasers. And ZS6LM/AM has been an airborne mobile over the Sahara. It is reported, by G6RC, that FP8AS can be QSL'd only *via* W2EQS, and FP8AR through W2HTI, or the ARRL.

DL4AAP will be operating as SVØWAA or SVØWJ from Crete and SVØWAB or SVØWQ from Rhodes; mostly CW, with some AM but no SSB. Call him 10 kc high — no replies to stations *on* the frequency. Mostly *Fifteen* by day and *Twenty* by night, from October 5 until October 13.

You may, by now, have heard AC4AX. If you have, he is probably genuine, since we understand that VU2AX was hoping to operate under that call from mid-September. No gen. on frequencies or times.

FE8AK is on Fifteen phone, and is ex-ZD4BZ . . . A new receiver (an HRO) is being shipped to ZC3AC *via* VS2DB . . . FL8AB continues to work CW around 14040, but tells us that his friends FL8AA and FL8AC are building their stations for Twenty phone operation and should soon be using it. FB8CD, in the Comoro Islands, is on phone most days, 14230 kc, around 1830 GMT.

Two W's are reported to have obtained permission to operate from a "rare European City (Country)." No further details, but we can only imagine this to be HV (Vatican City), at last.

VR6TC has not been sticking to phone and has been heard on CW around 14020 kc . . . A mystery station (at present) is K6IWG/HC6, said to be on "Isla de Puna."

VS1HJ's promised sortie to the Maldives looks like being "off" for the present owing to the condition of the airstrip there . . . VR3B has left Fanning Is. by now for VK, but is being relieved by VR3A.

VP8AO passes some real hot news, *via* G3ATH, to the effect that he is going mobile after November 14, *when he will be on his way to the South Pole.* He will be on 7 mc, using 10 watts—and any sort of DX contacts with him under these conditions would be *quite* a scoop. He particularly hopes to winkle out a G or two—he cannot want us as much as we hope to work him!

The latest rumours *re* Tannu Tuva are that UP2AS and RAEM are supposed to be going there, using the calls UAØKOJ and UAØON . . . There is also a buzz about activity from Tibet, with the call UAØKFF, of all things.

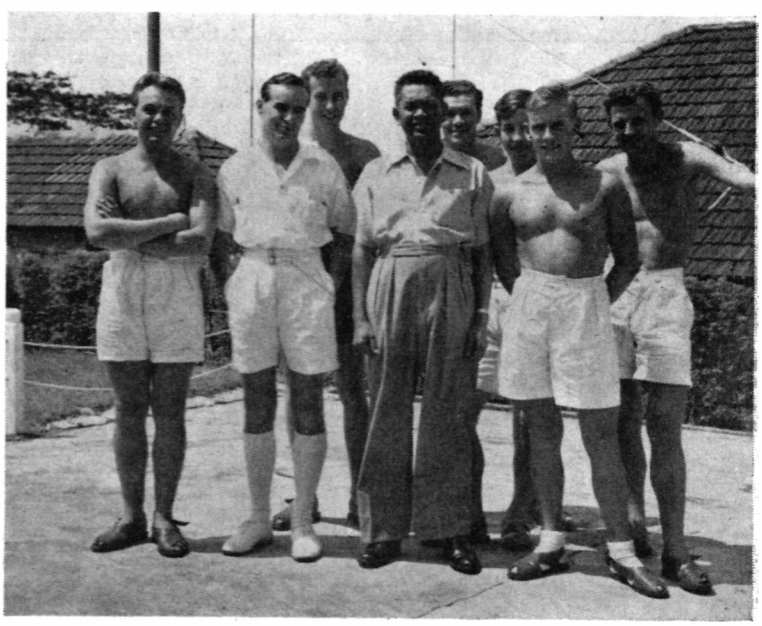
The Ghana prefix will probably be changed from ZD4 to 2G1 before long . . . OK1MB's hoped-for jaunt to ZA-land did not materialise at the time promised, but is still "on" . . . W6AM is now up to 242 phone, with I5FL and ZD4CM (Ghana) as the latest additions; last month's remark that his total of 272 must be the maximum has already been falsified by more recent events—he has a list of at least twelve more needed! This includes AC3, HV, JT, VQ9, VS9 (Maldives), XE4, ZL1 (Kermadec) and some that the W's are not allowed to count, such as 3W8, XW8 and XV8.

JA1EF's monthly reckoning of 40-metre DX (*JDXRC Bulletin*) includes XE's, KH6, KZ5, LU, CE and KM6AX. He seems to be the only JA interested in the band.

More Sheepskins

New certificates are becoming so numerous that we can only give them the briefest possible mention from now on. The newcomers are "Worked All Manawatu" (12 contacts with the Manawatu Branch area of New Zealand). Applications to include the Christian names of operators of all stations worked (!!). Send to ZL2HT, 70 Te Awe Awe Street, Palmerston North, N.Z.

The "Keystone Award" is issued by the Harrisburg Radio Amateurs Club for contacts with 100 different stations in Pennsylvania since January 1, 1957, with a sticker for working 25 Pennsylvania novice stations (for each



These happy-looking chaps are some of those forming the operating group on VS1HU, R.N. Wireless Station, Kranji, Singapore. Second from left is VS1HU (ex-G3JFF) who holds the licence. Operation is on 7 mc phone and 14 mc CW, running a modified ET4336 and a TCS Rx/Tx (for 40-metre phone). Long-wire aerials are used on both bands, with CR-100 receivers, and so far more than 1,000 contacts have been made in 83 countries.

calendar year) and another for repeating the original requirement of 100 Pennsylvanians in each calendar year. Further details from W3RPG.

There is also another new one, called the *Diploma da Africa Portuguesa* ("Worked Portuguese Africa"), which involves working CT3 (three stations); CR4 (four stations in three different islands of the Cape Verde group); CR5, Guinea (two stations); CR5, St. Thomé (one station); CR6 (15 stations in 7 different districts of Angola); and CR7 (15 stations in 5 different districts of Mozambique). The 40 cards thus obtained should be sent, with a check list and 10 IRC's, to CR6 Contest Committee, Box 64, Caala, Angola, Portuguese West Africa.

CQ Worldwide DX Contest

This mammoth affair, which probably attracts more DX entries and interest than any other Contest in the world, is again to be run under the usual rules:

Dates: October 26, 0200 GMT to October 28, 0200 GMT—*Phone.* November 30, 0200 GMT to December 2, 0200 GMT—*CW.*

Sections: (1) Phone, (*a*) Single Operator; (*b*) Multi-operator. (2) CW, (*a*) Single Operator; (*b*) Multi-Operator, (3) Novice Operator (Separate Class). (4) Inter-Club.

Serial Numbers: RST (or RS) plus Zone number (01 to 40).

Points: For stations on different Continents, 3 points; stations on same Continent but different countries, 1 point; stations in same country, no points, but QSO counts towards multiplier.,

Multipliers: One for each Zone worked on each band; and one for each country worked on each band.

As the Logging Instructions are rather precise, we quote them more or less in full, as follows:

(1) Fill in Zone number and Country only first time it is worked on each band.
(2) Use a separate sheet for each band.
(3) All times in GMT.
(4) Compute all scores; check logs for duplications and correctly calculated points credit before submitting them. Sloppy or ambiguous logs will be thrown out.
(5) Name and address on each log.
(6) Sign the usual declaration —that station has been operated in accordance with licence conditions.
(7) Use official log forms if available; otherwise it will be appreciated if the form used is *8½ in. by 11 in., ruled 52 contacts to the page.*
(8) Copies of the Zone and Country list, and official log forms, are available on application from *CQ Magazine*, 300 West 43rd Street, New York 36, N.Y. (att. Contest Committee). Overseas (U.K. and all others outside U.S.A.) entrants must send IRC's for return postage.
(9) Logs to above address, postmarked no later than December 1 for phone section and January 15 for CW section.

Those entering for this contest are also invited to send in their totals of scores claimed, with any comments on their impressions and experiences, to "DX Commentary" for mention in this feature.

FIVE BAND DX TABLE
(POST-WAR)

Station	Points	3.5 mc	7 mc	14 mc	21 mc	28 mc	Countries
DL7AA	830	109	166	230	175	150	244
W8KIA	732	68	148	265	138	113	265
G3FXB	715	72	129	207	182	125	231
G5BZ	704	64	118	240	168	114	246
G3FPQ	631	65	89	191	171	115	211
G3DO	600	24	46	229	149	152	246
W2EQS	539	79	114	161	104	81	177
W6AM	503	30	58	272	86	57	272
G2YS	447	65	85	146	97	54	163
G3WL	446	39	76	144	114	73	176
G3ABG	433	45	83	164	78	63	181
GM2DBX	417	34	31	158	100	94	173
G3BHW	406	15	32	150	117	92	184
JA1CR	348	19	49	174	70	36	176
W6AM (Phone)	347	13	32	242	39	21	242
G6VC	341	33	45	137	71	55	150
G3INR	330	46	57	124	60	33	135
G3GZJ	293	18	56	91	86	42	129
G3JWZ	282	50	61	72	66	33	116
G3IGW	272	42	63	82	64	21	110
G3JLB	270	41	43	67	64	55	110
G6TC	258	17	62	118	34	27	129
G3JZK	226	15	46	47	82	36	120
G3HQX	210	12	37	70	45	46	100
G2DHV	201	20	26	120	21	14	124
G2BLA	197	24	41	54	51	27	90
G3DNR	180	10	21	79	35	35	93
G3JJG	175	36	41	73	23	2	88
GW3DNF	142	21	30	49	33	7	58
G3IDG	87	11	15	20	14	27	40
G3HEV	79	10	21	20	24	2	51

(Failure to report for three months entails removal from this Table. New claims can be made at any time).

Around the DX Bands

G3DO (Sutton Coldfield) reports a good bag this month. Twenty phone brought him PX1AC, ZK2AB and OH1RX/Ø; Twenty CW raised W6UOU/KS6, C9XF (Manchuria); Fifteen phone accounted for FQ8AC, FE8AH and CP1AM; and on Ten phone PJ2CA was worked. All these were new ones this year.

G3HQX (Mitcham), on Twenty, just made his century with an OA on CW. An interesting one was VS2GM/MM, aboard H.M.S. *Cheviot* at Hong Kong; he and JA2NX were both worked around 2100 GMT. AC4LP was heard calling CQ in the early evening of September 8—sounding reasonably hopeful, with the right sort of "feel" about the signal.

GM3JZK (Argyll) finds things far more difficult up there than in Cambridge, which he thinks is an *ideal* DX location on account of the flat country and a highly conductive soil. From Cambridge, before leaving the University, he worked YV, EA8, HK, HE1MX/FL and HR3HK, all Fifteen

phone. From GM-land (on the Isle of Mull) he raised VP2VB, ZD6, CR7, EL, UJ8, XW8AG and F9QV/FC on Fifteen CW; he is surrounded by mountains except for a clear sea path to the SSW. Incidentally, GM3JZK also sends a photograph of a "historic occasion"—probably the only get-together of four amateurs on the Isle of Mull. He, with GM3EZO, GM3GCH and an SWL, met up at GM3GZC's new QTH at Tobermory. (Overseas readers, note—the Isle of Mull is *not* a country! Home readers, note—it is not even a county, since it scores for Argyll.)

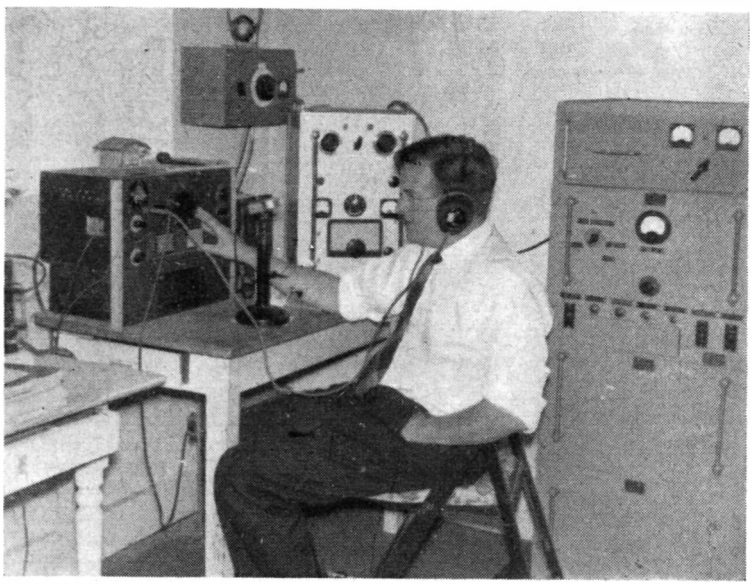
G2BLA (Morden) worked CR7, VQ3, XW8AG, VQ2, CX, ZP9AY and an LU on Ten CW; HC1RY on Fifteen CW; and EA9, VP6 and UF6 on Twenty CW. He says that quite a few countries worked in previous years now seem very hard to get—but three of them that he mentions (DU, FY and VP9) were all heard by your Commentator in one afternoon on Twenty CW!

G3IGW (Halifax) stuck to Fifteen CW, which brought in CE3RE, KH6BV, KZ5, UC2, VE6 and VE7. G3GGS (Preston) raised XW8AG on Twenty CW, also TA2CAS (GM2CAS in Istanbul) and UAØKKB in Zone 19. He found some nice openings on Ten and worked mostly South Africa and South America.

G3BHW(Margate) got LA1VC/G for a second QSO, and finds he is in Queen Maude Land; two good ones for him on Fifteen CW were KW6CE and KX6AF.

G3CMH (Yeovil) had a good month on phone. *Ten* was used for CR7LU, CX, VP6, VQ2, VQ6, ZD2, ZD6, ZE, ZS and a W in New Mexico. All W districts were heard on 10 metres on September 8, with an abrupt change to what might well be winter conditions. On *Fifteen* they worked CE, HH, HI, HP, KA, KH6, KW6CA (1100), PJ2MC, VE8ML, VK9HO, VP4, VP7, VS4JT (0800), ZK1BS (0930), ZP and some "rare" W7's. These are only a few taken from the Yeovil Club station's long list. Gotaways on Fifteen phone included FE8AK and two VR2's.

G3ATH (Tattershall) made late-evening QSO's on *Twenty* with KZ5BB, VP5KJ, VP8AO, VP8CI, VP9Y, 3V8AS and many others; he runs 150 watts to a 20-metre dipole only fifteen feet high, and from where he sits he looks out along the aerial . . .



G3KQP of East Molesey has been licensed for two years and is regularly active. The transmitter in the centre-background is a Chinese copy of the LG.300, entirely home-constructed (by G3KQR) powered from and modulated by a modified T.1131, in the rack to the right. The receiver is an HRO, and on the wall is the all-band aerial tuning unit, which also includes a dummy load. The T.1131 relay system has been adapted for the change-over control.

This reminds us that G3BDQ (St. Leonards) habitually looks *down* on his aerials from the operating position! But they work, judging by his lists, which include, for *Fifteen*, XW8AG (1400), UAØSK (1530), KR6BF, VE8PB, KL7ALZ, XE1PJ, VS1FJ and JA's (on CW) *plus* VQ6ST (1430), VK6EJ and VK9HO on phone. *Twenty* CW brought in KH6JG and KW6CA. *Ten* phone collected a few W's on odd occasions.

G3BKF drops a card to say that he has moved to a new QTH at Loughborough and has erected the old faithful "long piece of wire"—so he's in the market for DX again.

G2WD, an Old Timer from Stoke-on-Trent, is bound for the West Indies, where he will "come up with a VP call of some sort." He thinks VP6 will be the first effort, but he might end up in Grenada with a VP2G call. He is taking out gear for 80-100 watts of AM and SSB and looks forward to holding a more or less exotic call for a change.

G2PU (Cambridge) tells us that ZK2AB claims their contact on August 3 as his "first intelligible phone QSO with the U.K." VR6TC was G2PU's third VP6 on phone—he worked him on both Fifteen and Twenty. Others in a long list are VK9AD, VR2AG, KP6AL, VKØCJ, VS4JT, VK9HO and VK9AJ. G2PU closed down his old QTH with a flourish, collecting FS7RT, VP5FH, CR5SP, ZM6AS, ZD8SC, KX6ZB, FO8AB and ZK1BL. He is now looking out for VK4FE (Thursday Is.), FK8AS, FU8AC and the others who have been holding out on him so far! Needless to say, the transmitter is an LG.300 . . .

G8ML (Cheltenham) writes to say that W2HWA was aboard the *Mayflower II* at Plymouth as a *visitor*, not as operator; so we hasten to correct the statement on p.362 of the September issue.

G3HLY (Godalming) brought his Marathon total up to 173 with FK8, KP6, FO8, YN, VS4, KW6, XZ, FP8 and VR2's as the best ones. He had heard, but not worked, JT1AA (Mongolia and

Zone 23) at the time of writing.

All-time new ones for G3DNR (Broadstairs) were LA2JE/P, CO, UL7 and OHØ. Also worked—TA2CAS, OY2H, EA8, UO5 and UO9. All this on Twenty, but G3DNR hopes to be on Fifteen and Ten shortly.

G3ABG (Cannock) put his Twenty CW through to HA5AM/AM (over Sofia), FG7XC, VS9AD and VP8AO; Fifteen CW collected JA, MP4, VP2VB, VS1JF (ex-GW3LQP), OQ5, VO and KL7. Fifteen phone was rewarded with MP4, VQ6ST, VQ4ERR, and W7's in Idaho and Montana. KL7FAR, during a display of "Aurora" conditions, gave G3ABG a report of RST 333!

G2YS (Filey) collected FB8BD on Twenty for a new one, but Tx trouble prevented him from doing much more; gotaways were YA1AM, VQ6AC, EL3S and other good ones. G2YS comments on the activities of the "wreckers" on Twenty (*see* last month's comment) and wonders why the DX men don't get tougher about listening on their own frequency. He tells us that OA7I, who is ex-PAØXE and no mean operator, keeps a black-list and doesn't hesitate to put new names on it.

G3JJG (Mitcham) raised CR6AI, FF8CA, CR7, IS and some Russian districts on Twenty; also UO5 and UB5 on Fifteen. On Forty he worked LX1AS, but is not sure whether he is good; ZA1KAD and TA were also heard on that band.

Talking of *Forty*, G3BST stayed on the band and worked HE1AB, FA, 4X, EA9EF, UO5, TF5TP and ZB1SS (the latter using but 5 watts). He says "Don't go on so about the CQ menaces . . . if they all called DX *intelligently* there would be even less for the likes of me." Something in that!

New ones for G3JKF (London, W.5) were VP2VB, ZP5EC, OY5S, FB8XX, ZK2AD, CR6, KA and ZD2, and other nice ones included two ZP5's and FB8BV on Ten phone. G3JKF is now using a 33-ft. vertical, centre-fed. You can't go wrong with vertical wires.

G3GZJ (London, S.E.23) collected DU6IV, KR6BF, OHØ and other new ones on Fifteen; UO5, UF6, UJ8 and more of the like on Twenty. Forty brought him a UR2 and an LU.

G3FXB (Southwick) raised FB8XX (14040 kc, 1500 GMT)—"QSL to FB8BC." G3FXB did, and got back a card by airmail, with French Antarctica stamp and all! Other DX included ET3XY, HK7LX, VQ6ST and ZD4CL (Ten phone); KH6, OHØ, VK9JF (Cocos), VR2AG and 2BC (Fifteen phone); FQ8AP, KA5MC, KW6CA (Fifteen CW) and FB8XX and ZC5AL (Twenty CW). "Near misses" were YA1AM and ZM6AS. YA1AM says he is running 1 kW, but it sounds more like five of them . . . ZM6AS was working W's at 0800 on Twenty. There is apparently already a bogus "JT1AA" using Fifteen phone . . .the real one has neither mike nor modulator.

Other shorts from G3FXB—FE8AH and 8AK are both on Fifteen phone; VR3R is active, same band; YK1AT is there on Twenty CW; KB6BH is being worked by ZL's on Fifteen phone.

G6TC (Wolverhampton) raised a lot of W's, including W6MOJ, and also ZL2AJO — *on Forty*. Twenty fetched in VS6, CE, ZP5AQ and two VK7's; Fifteen caught OA4EY and EL1P. On August 24 G6TC worked W6 on all three bands.

G3LNR (Nottingham) is always hearing DX on Forty but can't work it . . . he mentions LU's TF5TP, OX3DL, KZ5RF and ZA1AB, who vanished and left the band going blue with "CQ ZA" calls! On September 12 K4BUR was 579 at 0820, but had to call "CQ DX" three times before he got a QSO.

G3KMA (London, N.W.11) got his Twenty CW across to two HB1/FL's, ZD2DCP, OQ5IE, VQ4, VS1, YK1AT, FP8AP, KH6IJ and a WØ. Forty raised GD3UB and ZC4GT, *plus* W's and PY's; he noted (as we did) that the recent major solar upheaval left even *Forty* quite dead on occasions.

Hot!

G3FPK (London, E.10) gets in at the very last minute to tell us that he will be 3A2BT from October 6-12. He hopes to work DX between 0800 and 0900 GMT, after which the Europeans will get a chance. No calls on his frequency—he will first listen 10 kc higher. QSL's to all stations asking for them, and G3FPK hopes they will reciprocate, as he wants to make DXCC from 3A2. The rig operates from 3.5 to 28 mc, with 50 to 100 watts input.

News from Overseas

VS1HU was originally the call issued to G3JFF in Singapore, but there was so much interest in the P.O.s' Mess at the R.N. Wireless Station, Kranji, that it soon became a Club call. Since July the Kranji A.R.C. have worked 83 countries, using Twenty CW, and Forty CW and phone. They run a modified ET-4336 and a long wire, on which over 1000 QSO's have been made. *Forty*, out in VS1, brings in W6, KR6, JA, VK, ZC5 and the like. On *Twenty* anything goes; a few good ones extracted from the list are HS1WR, KC6KG, KX6AF,

W A Z MARATHON, 1957

All Bands

Station	Zones	Countries
G3HLY	39	173
G3DO	39	165
G3BHW	39	165
G3FKM	39	164
G3FXB	39	162
G3BDQ	39	142
G3JKF	38	117
GM3EOJ	37	104
G3HCU	36	98
G2DC	35	102
G3GGS	35	99
G3GZJ	34	100
G3FPK	34	91
G5FA	34	89
GM2DBX	33	87
G2BLA	33	82
G3LET	33	81
G2HQX	32	93
G3JWZ	32	88
G6PJ	32	86
G3DNR	26	78
ZL3CP	24	52

LA8YB (Spitzbergen), VKØAB and 9XK, VQ6's, VR2DD, XW8AB and 8AG, ZC5RF and a host of South Americans, who, of course, look like DX from VS1.

ZL3CP (Christchurch) has had a long spell *off* the air; so has not been able to put much effort into the Marathon. During a short stay at home he has added a few more, such as KC6, VK9, CP, HC, KW6 and HB1MQ/FL. (By the way, we have to break it to him, very gently, that the FL suffix signifies Liechtenstein, not French Somaliland!) An interesting one for ZL3CP was CP1CJ/AM, airborne high over Bolivia.

W6YY (La Canada) now makes it clear that Sheepskins are really so-called because the graduation certificates from most American colleges and universites were, until about 1900, actually inscribed on a piece of sheepskin. John has not seen one for a long time, but says he has quite a few Certificates! He sends along a tabulated guide to Russian call-signs, more or less confirming the one we published on p.368 of the September issue. Thanks again to W6YY for his constant flow of most interesting news.

DL7AA (Berlin) puts himself even further out of reach at the top of the Five-band Ladder. New ones of note were HI8BE, VK9AJ, FO8AC, KP6AL and CR10AA (all Fifteen CW); ZK2AD, FB8XX, FE8AH, HI6BE and ZA2ACB (Twenty CW); and VP5BH (Ten CW). On Twenty, Rudi also worked HL2AM (ex-KØCSW) and C3CG (Box 101, Peiping). He tells us that he has now worked 26 Zones on Eighty, 39 on Forty, WAZ on Twenty, 39 on Fifteen and 38 on Ten. Arising out of this, he suggests a Five-Band Zone Table once in a while, with a maximum (naturally) of 200 points.

TI2OE (San Jose) writes that the QSL procedure for TI9CR—the expedition station to Cocos Island, sponsored officially by the Radio Club of Costa Rica—is *via* Box 2412, San Jose, Costa Rica. The operators were TI2CAH and TI2LA.

Top Band Topics

Although we have already predicted that this season will be extremely tough for Top-Band DX, we are assured that there will be no lack of activity. During the past month W2EQS has been out on his FP8 expedition, which caused quite a stir in the States, but has not, so far as we know, raised a ripple on this side of the pond. The calls were FP8AR and FP8AS, as mentioned earlier.

G3IFB, Kenton, Middlesex, was licensed in March, 1952, and now has 125 countries worked in 37 zones, gained mainly on Ten/Twenty, using CW. The transmitter runs 807's in the PA, at 150w. input and for phone the modulator is a pair of 807's in Class-B. The receiver is an HRO-5 and the aerial is cut to be 3-half-wave on the 14 mc band (102 ft.), fed at a low-impedance point through 80-ohm line.

Last month, it was said here that W2EQS had worked FP8AA on the 160-metre band, but we did not give him credit for being the first to do so; this contact was, in fact, a *First*. Yet another is reported, this time between W1BB and OA5G of Lima; contacts were made on August 18 and 25, and September 1. OA5G normally runs the full kilowatt on all bands (he can do so on One-Sixty!) but for these tests he only used 100 watts.

OA5G will be on Top Band all through the coming season; his signal must be pretty potent, because the W1BB/OA5G tests were logged in Iceland by TF2WCC, who copied W1BB solidly and heard the Peruvian signals weakly. Congratulations all round on another pioneer achievement on this difficult LF band.

DL4AAP/W6GHM, who will be on Crete and Rhodes during October (*see* "DX Gossip") says "Top Band operation is a possibility"—but that's all we can say about it.

VR3A (Fanning Island) also says he hopes to be on One-Sixty when he really gets the station going again, which should be very soon. This will interest the ZL's and W6's, but we can't see much chance from where we sit!

Olof Karlsson is a listener in Malsryd, Sweden (SM6-2917), and he writes to say that he has heard 161 different G's, seven GM's, three GW's, one GC and one GD, as well as seven DL's and 17 OK's. He has listened regularly to G8ON's sked with GC3KAV, both on CW and phone. Many G's were heard on phone on August 31, 2200-2300 GMT, despite much QRN and QRM on the band. All this on 160m.

W3RGQ (Nescopeck, Pa.) tells us that he will be calling "CQ DX" every Wednesday, Friday and Sunday morning during October, from 0445 to 0515 GMT; he will be on either 1801 or 1820 kc and will tune for DX between 1800 and 1835 kc. Europeans should call him between 1825 and 1835 kc. He, too, worked FP8AA and OA5G, and says the latter was 559 in the States at times. OA5G's frequency

was 1801 kc. (Thanks also to G3LOE for confirming these items.)

G3LEV (London, S.W.16) raised GM3KHH/P (Nairn) and GC3KAV (Guernsey) on phone. G3LNR was bothered by static but did raise two new counties. G3JHH (Hounslow) worked GM3CMJ/P in Sutherland for his 90th, but has not been very active. G2NJ (Hunts.) worked HB9QA and GI3LFH, and heard EI8J and GI2AFW. He also worked seven more counties on phone, making his total 37—all from the boat in Hunts.

TOP BAND COUNTIES LADDER

(Starting Jan. 1, 1952)

Station	Confirmed	Worked
G2NJ	98	98
GM3EFS	97	97
G3JEQ	95	96
G6VC	95	95
G3GGS	92	94
G3HEK	92	94
G3FNV	90	92
G3AKX	89	89
G3JHH	89	89
G2AYG	88	88
G2FTK	86	91
G3KEP	85	85
G3ABG	79	81
G2CZU	77	77
G3KOG	75	79
G3DO	75	75
GM3KHH	66	72
GM3KLA	66	68
G2HDR	65	67
G3KYU	62	62
G3EJF	60	65
G5JM (Phone)	55	58
G2CZU (Phone)	55	55
GM3COV	49	62
G3KEP (Phone)	47	60
G3HKF	47	61
GW3HFG	46	63
G3KXT	39	43
G3JSN	35	52
G3JZP	35	45
G2AO	30	53
G3LBQ	27	44
G3LEV (Phone)	26	35
G3LNO	23	41
G3LNR	17	26
G3IUW (Phone)	12	25

Miscellany

G3LEV tells us that G3EWJ is now on Christmas Island (VR3) and that G3KIK will have departed for the same spot before this appears. They are hoping to use an ET-4336, Twenty CW and phone, and will listen for G's around 1900 their time. Call-sign details will follow as soon as we know them.

G3LKO (Erith) reports that the real reason for YI2AM's closure was *not* the "state of emergency" but the simple fact that someone forgot to get the licence renewed! Application for renewal was thereafter turned down for various strange reasons. G3LKO was secretary and treasurer of the Club at the time, so he should know. It appears that nothing has yet been achieved, and YI2AM has not been heard on the air since September, 1956.

G3GQK (London, S.E.23) preaches the virtue of patience; he was licensed in 1950, and his fourth QSO was with an ordinary F8—whose QSL has just arrived *direct* after seven years!

SWL Corner

Many SWL reports, and little space, so severe condensation is the order of the day. From M. J. Prestidge (Birmingham): C9XF (Manchuria) is said to be on 14125 kc CW. From E. N. Cheadle (London, N.W.7): Heard on Fifteen phone — CR4AD, FS7RT, PJ2MC, YN1MF; Twenty phone — KC4USK and 4USW, TG9AL, VR6TC, VK9AD and ZL5AA; YS1MS also heard, and a bit of a rarity these days.

From P. Day (Sheffield): Fifteen phone — VR2AG, 2AZ and 2BC, FE8AK, YN1MF and KC6KG; Ten phone — CR7's, ZD6JL, ZC6UNJ, ZD4CH, FB8BV and (very consistent) ZC4IP. Gossip —VS5AT will be on Twenty CW during October . . . VS4JT will also be a VS5 in October . . . VU5AB said to be on Fifteen phone . . . VK9JF (Cocos) on Fifteen phone . . . G3HFD (Sheffield) has had 120 contacts with VK3AZY on Ten and Fifteen phone, the VK never using more than 12 watts and often less. *Thanks, P.D.*

G3LWM (Enfield) writes to say that he has just been licensed and would welcome *all* SWL reports on his CW, 7015 and 14030 kc. He is running a B.2, mostly after TV hours.

"Yasme II" Expedition

Most readers will already know that Danny Weil, of *Yasme* fame, arrived home at Christchurch, Hants., during September. He is starting his search for another suitable boat immediately, and plans to be off as soon as possible on another attempt at the single-handed round-world trip.

He is assured of all the radio gear he needs, from American sources, and has the necessary capital to buy the right boat, when he finds her. Operation is promised from several spots that have not yet been covered, as well as many of the old favourites. His call when on the high seas will probably continue to be VP2VB/P, other calls being allotted by the various administrations concerned.

We will try to give up-to-the-minute information on his probable points of call, frequencies, times and so on, as soon as we know more. [*And see p.441.*]

Late Flash

On September 16 your Commentator was QRX for JT1AA on 14060 kc, and is now in a position to report on the greatest pile-up in history—which is great fun to watch if you are not taking part in it yourself! At 1130 GMT a CQ from JT1AA was answered by all W districts, numerous VE's including VE6 and 7, VK, ZL, South America, VS6 and a whole horde of Europeans. Calls were all of different lengths, so it was ten minutes before JT1AA emerged again. By this time everyone else had heard the noise and was jumping in, too.

Around 1400 a similar state of affairs was still evident, but a brand-new phenomenon emerged —the Pile-Up Parasite! In among the mob calling JT1AA was a straight VK3 with a very good signal. Inevitably, various Euro-

At a meeting in Tokyo recently, in front, seated, left to right we see: JA's 1AA, 0AA, 1CR, 1AB, 1KF; standing, left to right, 1VP, 3IW, 1CO, 1CJ and 1EF.

peans thereupon appeared on the frequency calling the VK. Among them was (of course) a YU6, whose call as he stuttered it out sounded just like "KX6"—so up came a third layer, calling the "KX6" who was calling the VK who was calling JT1AA. Had we been chasing, we would have been exasperated, but, having decided to wait for at least a month until JT1AA becomes an established DX station, we just sat back and laughed as we have not done since we last saw the other Crazy Gang.

Unfortunately, JT1AA *was* working stations on his own frequency, which made things pretty hopeless for him, and everyone else. Each time he stopped sending, there was a noise like Chinese bagpipes, extending about 5 kc either side, outside of which all was quiet. We passed a message *via* OK1JX, his original mentor, to try to persuade JT1AA *not* to listen on his own frequency. The last arrival we noticed was a Russian jammer, plumb on the same spot, at which we pulled all the switches within reach and went to watch some nice TV . . .

Next month's deadline is **first post on Friday, October 18,** and the following one *November 15.* Please note these dates and be sure of catching them—"within a day or so" is not good enough, as we work to a very tight schedule. Address all your notes and news to "DX Commentary," *Short Wave Magazine,* 55 Victoria Street, London, S.W.1. Meanwhile, Good Hunting and 73. BCNU next month and — Look out for JT1AA!

ANOTHER QSO COINCIDENCE

On August 20, old timer G8IX (Stoke-on-Trent) was in contact with G3KDE, Freshwater, I.o.W. (ex-VR3G, and recently on Christmas Island). In the course of the QSO, it transpired that G3KDE's father, who was sitting with G3KDE at the time, had been an instructor in wireless telegraphy in H.M.S. *Vernon,* 'way back. The point of the story is that G3KDE's father is Major J. Cheesman, R.M.L.I. (retd.), and G8IX was a boy-telegraphist in his class in *Vernon* in 1914. After passing his course, Leading Telegraphist G. Tagg (as G8IX then was) served under "Evans of the Broke" during the First War; his outstanding recollection is copying the Admiralty signal instructing the Fleet that an Armistice had been declared for November 11, 1918.

NICE AERIAL FOR TOP BAND

We hear from G5HO (Waltham Abbey, Essex) that he now has a vertical aerial 63 ft. high for 160 metres. It is both inductive and capacity loaded at about 18 ft. from the top, with a coupling coil housed in an enclosure at the foot of the mast. The system is fed by coax, run in a trench, and an extensive earth-mat is in use, consisting of eight radials of 10g. tinned copper, each 120 ft. long and buried to a depth of about six inches. The vertical radiator consists of three strands of 18g. PVC-covered wire run up to the loading coil, the section above being single 18g. G5HO will shortly have a full half-wave *horizontal* aerial as well, both systems being brought to a change-over panel; the idea is to be able to check results instantly on distant signals, as between the vertical and horizontal aerials. On the vertical array, very good contacts were obtained with the mobiles during the recent Essex Mobile Rally, the polarisation of the system of course favouring the /M aerials. G5HO will be very glad to have reports and contacts at distances over 100 miles.—*QTHR.*

RADIO HOBBIES EXHIBITION

Among the firms represented at the Amateur Exhibition to be held during October 23-26 will be: Cossor, K.W. Electronics, Mullard, Enthoven, Labgear, Philpotts, Standard Telephones, Clyne Radio, Whiteley Electrical, Panda, Iliffe's, Minimitter, Taylor Instruments and E.M.I. Institutes. There will be numerous other stands of Amateur Radio interest, including the R.A.F. and B.A.T.C. displays, and a UHF/VHF section. Our own stand will display a full range of our current publications and, as in previous years, we look forward to meeting many readers. The Exhibition is at the Royal Horticultural (Old) Hall, Vincent Square, London, S.W.1, which is in the near neighbourhood of Victoria Station.

CHANGE OF NAME—LABGEAR

We are asked to announce that the style and title of the well-known Cambridge firm of radio equipment manufacturers is now Labgear, Ltd., "Cambridge" having been dropped from the name.

SOME SLIGHT CORRECTIONS

High Selectivity IF/AF Amplifier. In the table of values on p.346, September, C42 and C43 should read in μF, and not as given; at the top of the left-hand column on p.345, the figure should be 466 kc and, on the same page, 5000 for the apparent Q, line 9 in the right-hand column.

Motor-Cycle Portable/Mobile on Two Metres. In the valve-base sketches on p.383, that of the 6J6 is shown incorrectly; the anodes and grids have been reversed. The 6J6 base connections have frequently been given in the *Magazine,* and can be checked by referring to p.243, July — or p.403 of this issue.

SSB Topics

TECHNICALIA, ACTIVITY & OPERATING RESULTS

Conducted by R. L. GLAISHER, G6LX

THE evening Single-sideband nets on the high end of Eighty are a constant source of information and interest to the active European SSB operator. The subjects discussed during these nets are many and various, ranging from complex theoretical arguments to providing helpful advice for the newcomer to SSB. One topic, however—that of SSB operation on the DX bands—is always good for a friendly wrangle, as many of the operators who take part in these round-tables are strictly single-band workers. This loyalty to 80 metres is largely a matter of personal preference and is not dictated by technical considerations or lack of suitable equipment. A few of these operators (and the number is growing) feel that although they would like to broaden their scope by working the DX bands, it would be a waste of time trying to compete with other British stations using high power and complex beam aerials.

This is a misunderstanding of the present situation, as the majority of British SSB stations on 14 and 21 mc use simple aerials and run no more power than their eighty-metre colleagues. Many of the high scorers on the Country-Worked ladder do it with long wires (a half-wave on 3.8 mc is a long-wire on the DX bands). Dipoles and ground-plane type aerials also find favour; for example, DL4SV has a single long-wire, G3MY has collected most of his countries on a ground-plane, and at G6LX half-wave dipoles have accounted for over 80 countries worked on two-way SSB.

Due to the skip effect, interference difficulties on the HF bands are generally less troublesome to SSB reception than the constant background of commercial CW (which is a regrettable feature of most 80-metre nets).

To sum up, SSB on the DX bands has several distinct advantages over other methods of communication :—

(1). The inherent "system" power-gain of the SSB mode of operation.

(2). The ability of SSB to "get-through" under poor propagation conditions.

(3). The ease with which SSB will raise a rare one because of the lower numerical strength of the competition compared with other systems (CW and AM). This is a situation which we hope will not prevail for long.

(4). The greater flexibility and operating convenience obtainable with a carrier-less type of transmission and full voice-operated break-in.

(5). The general impression of friendliness and lack of cut-throat operating tactics that prevails amongst the SSB fraternity.

The Racal RA.17 Receiver

Although not specifically intended for SSB, this new receiver has many features which make it interesting from the technical standpoint. By means of a novel triple mixer circuit, it has been possible to combine excellent performance with a high standard of frequency stability and re-setting accuracy. The frequency range is 500 kc to 30 mc and is covered without any form of oscillator or mixer band-switching.

The block diagram of the RF and IF sections is shown in Fig. 1. The input signal is amplified and mixed with the output of a precision VFO operating in the range of 40.5 to 69.5 mc to provide a signal to the first IF at 40 mc±0.65 mc. The output from the VFO is also mixed at the same time with all the harmonics (first to thirty-second) from a 1 mc crystal oscillator and harmonic generator. This second mixer is followed by a filter that will pass 37.5 mc±0.15 mc. The signal from the filter is combined with the first IF in a third mixer, and the product is fed to a conventional single-superhet covering the range 2-3 mc.

Two tuning scales are used; the first. which can be regarded as the band-set, is calibrated in megacycles and tunes the VFO. The second scale is constructed on the film strip principle and is calibrated in kc divisions. The effective scale length is equivalent to 145 ft., corresponding to 100 kc per six inches, which is constant over the entire frequency coverage.

By the use of this triple-mixer arrangement, VFO drift is not important, as the error cancels itself out in the third mixer. Conventional tuned-stages in the RF and first mixer are not required, as the very high first IF, combined with a signal low-pass filter, provides sufficient pre-selection for normal working. The RF stage can be tuned if additional pre-selection is necessary and switching facilities are provided for this purpose.

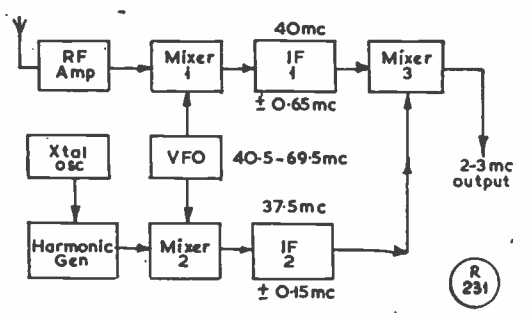


Fig. 1. Block diagram of the Racal Type RA-17 Receiver, a revolutionary design which has been attracting a good deal of interest recently.

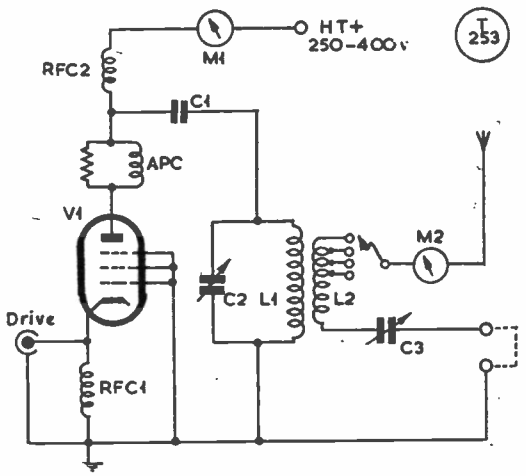


Fig. 2. Grounded Grid Linear Amplifier for 160-metre operation Any suitable small pentode or tetrode can be used, and several have been tried—see text.

Table of Values

Fig. 2. Ground-Grid Linear RF Amplifier for Top Band

C1 = .001 μF, 1000v.
C2 = 250 μμF (or larger)
C3 = .001 μF (500 x 500 μμF BC tuning with sections in parallel)
APC = 20/100-ohm 1-w resistor wound full of 18g.
RFC1, RFC2 = 2.5 mH RF choke
M1 = Plate feed meter
M2 = RF meter, 0-.5 amp.
V1 = Any small pentode or tetrode (*see text*)
L1 = 50 turns 18g. on 2-in. former, over 3 ins.
L2 = 15 turns 16g. spaced over 3 ins., overwound on L1 with ¼-in. separation, tapped each 2 turns.

The high re-setting accuracy is achieved by using a 100 kc pulse calibrator which is triggered from the main 1 mc crystal. Provision is made for adjustment of the scale pointer so that it can be set exactly on frequency at each 100 kc point on the long film scale.

The conventional superhet section has a switched variable-selectivity IF circuit, which provides bandwidths of 100 c/s to 8 kc. A 3 kc position is included for SSB reception, and the very stable BFO is adjustable over the range ±3 kc. The AVC circuit can be set for either long or short time-constant operation and can be used for CW and SSB reception. A noise limiter and S-meter complete the facilities that have been provided in this exceptionally fine example of modern receiver design. Oh, yes, we forgot to mention that an RA.17 receiver is in use by a G-sidebander who is very enthusiastic about its 80-metre performance!

SSB on Top Band

There are a small group of SSB operators in the South of England who use 160 metres for local chats, mobile operation and club nets. As briefly reported in the September issue of SHORT WAVE MAGAZINE, this group feel that there should be a greater occupancy of One-Sixty by British sideband operators. The band is an excellent alternative to 80 metres for inter-G working under winter conditions and is not so prone to skip difficulties. With this object in view, "SSB Topics" have been asked to sponsor some form of "activity evening" to encourage other sidebanders to give 160 metres a try.

The first activity evening will therefore be on October 14 at 2200 clock-time, and further nets will be organised for the following Mondays. With the 10-watt power limit in the U.K., barefoot exciters and baby linears are all that is necessary. Any aerial that will load "Marconi-fashion"—and this means almost anything, from a barbed-wire fence to a rhombic—should suffice. The circuit of a grounded-grid linear with suitable coupling arrangements for a Marconi aerial is shown in Fig. 2. This will work on 160 with almost any type of tetrode or pentode valve, and models have been tested using the 6F6, 6L6, 6V6, 6AG7, 6BW6, 6CL6, 6CH6 and QVO4-7 types. Although the drive requirements are small, because of the grounded-grid connection a larger than-usual link winding may be required on the exciter tank to provide optimum matching for the near 300-ohm input impedance of the amplifier.

The coupling and loading arrangements are suitable for a wide range of "random" length aerials and should cover all the types now in use by the 80-metre fraternity as well as the DX gatherers on the HF bands. The counterpoise is an effective alternative to an indifferent earth connection and can consist of a length of wire (60ft. or longer) insulated from earth and located at ground level under or nearly under the aerial. The handbooks describe massive multi-wire counterpoises and buried radial earths as being essential for optimum performance. It would be very interesting to be able to try a good aerial/earth system on Top Band, but for the time being we will have to be content with a 14 mc dipole, loaded against a disused length of TV coax. The method of adjustment for matching the aerial to the transmitter is just a question of finding the correct combination of loading-coil tap and series condenser to obtain maximum RF into the aerial. For really long-wires (over 200 ft.) other methods of loading are often more convenient.

The present band-limits for British amateurs are 1800 to 2000 kc, and the band is allocated on a "shared" basis. Below 1925 kc are a number of spot frequencies used by British and Continental coast stations working the "Small Ships" radiotelephone service; above 1950 kc is Loran and other commercial traffic circuits. As the 1925-1950 kc segment is relatively clear of commercial stations,

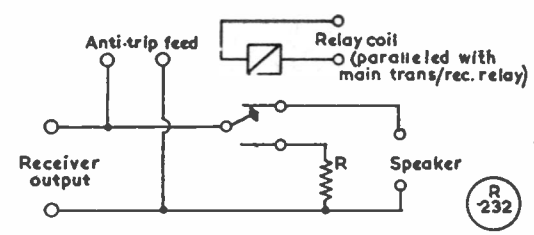


Fig. 3. Circuit for muting the receiver output, the method being to use a load resistor R to suit the speaker input.

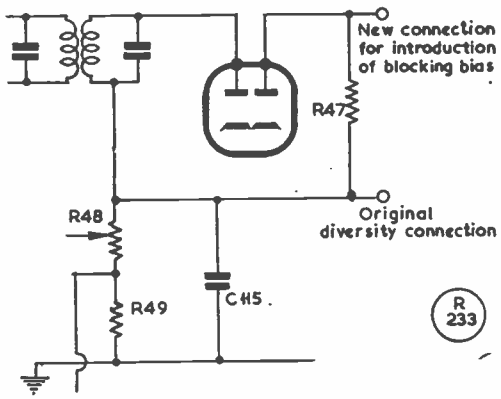


Fig. 4. The vexed question of muting the AR88 is discussed in this month's SSB article. This is the relevant part of the AR88 detector and AVC section, with component numbering in accordance with the manual and chassis identification. C115, R48 and R49 are as originally fitted; R47 is made 2.2 megohms.

the South of England stations will be using this part of the band on October 14.

Co-operation has been promised by a number of our Continental readers. Several of these can use 160 metres and are building high-level mixers and linears. Others who have licence difficulties will monitor the band and report results through "SSB Topics."

This could be a lot of fun, so please try to get on the band for the first of the activity evenings, 2200 clock-time, October 14.

Query Department

Number one this month is from a reader in Swansea, who is changing over to SSB. He is using an AR88D receiver and would like to know if there is any way that a muting circuit can be added for voice break-in operation. He has tried the circuit described by G3HSR ("Automatic Change-over System," SHORT WAVE MAGAZINE, August, 1957), but finds that it will not work with the AR88, as it shorts the bias line. He has also considered the method of opening the loudspeaker feed and introducing a load resistor during "transmit" (Fig. 3), but is worried about possible damage to the receiver output transformer, due to transients.

A very large number of sideband operators use the speaker method without trouble, but, of course, there is always the chance that the change-over relay may stick or chatter. The AVC system used in the AR88D lends itself to "blocked bias" keying for fast muting, as there is some resistance left between the AVC line and earth when the AVC is switched off for SSB reception. The blocking bias can be switched electronically by means of the W9LIJ circuit (p.170, *Single Sideband for the Radio Amateur)* or by using extra contacts on the main send/receive relay; 35 volts of bias will "kill" the AR88D and can be obtained from a deaf-aid type battery. The most suitable point in the receiver for the introduction of the mute voltage is by a direct connection to the anode of the AVC diode (P2 on V8). The diversity terminal is connected to this point *via* R47 (2.2 megohms) and provides a neat and easy method of "getting into the works." As this resistor is part of the AVC/Detector circuit, it must be left in position and cannot be shorted out. The change, however, is very simple once R47 has been identified. The circuit of the AR88D detector and AVC stages is shown in Fig. 4.

It will still be necessary to provide a connection from the speaker to the exciter if "anti-trip" facilities are required. (The W9LIJ circuit incorporates a gating valve for this purpose.)

Station of DL4SV/W1EO, Munich, with a GG Linear RF amplifier consisting of a pair of 837's driven by a 20A sideband exciter. His receiver is a Collins 75A-1.

Next, another receiver question, this time concerning the possible use of a product-detector with the Eddystone S.640. Our correspondent does not wish to modify the receiver, as he considers this will lower the re-sale value, and he queries the possible use of a plug-in adaptor.

Not being too familiar with this receiver, it is only possible to generalise. Satisfactory product-detector adaptors have been constructed using the Collins 75A-4 circuit ("SSB Topics," August, 1956), and are being used in such receivers as the Super-Pro, SX28, AR88 and CR100. The circuit of a typical adaptor is shown in Fig. 5, and this should be applicable to most receivers, provided that connections can be made to the last IF stage, BFO output and audio circuits, in addition to

finding a source of heater and HT supplies.

Lastly, a request from New Zealand for the circuit of the G3CWC exciter. Several years ago there were a number of duplicated information sheets circulating amongst the G sidebanders which described this exciter and gave the circuit details. If anyone has a spare copy, please send it along and we will pass it to our correspondent.

News and Views

Welcome to the first British father-and-son combination on single-sideband. G3KTU (Esher), who has been on 80 metres for quite a time, has now been joined by his father, who has just been licensed as G3LVM. Their joint station has been modified for 14 mc SSB operation. A ground-plane aerial 20 ft. high and 100 watts peak has accounted for CR9AH, VQ4EO and many W stations. G3KTU is due to spend several years in the Nottingham area and is planning /A operation with a small portable SSB transmitter.

G3IRP (Morden) joins the country-worked ladder with a total of 37. He is one of the group pleading for more SSB activity on 160 metres. See you on October 14, OM. G3BFP (Shirley), another Top-Band SSB operator, has been testing mobile gear. YU1AD (Belgrade) is licensed to operate 160 metres and is building a mixer unit so that he can join in the *fracas!*

SWL Alcock (Potters Bar) has sent along details of his new selectable-sideband receiver. Incorporating two separate double-cascaded half-lattice crystal filters, a product detector and "hang" AVC, it sounds as if it should be a really first-class job. SWL Alcock has been interested in SSB reception for nearly three years and has logged over 190 different British SSB stations (mostly on 80 metres). He complains that G sidebanders do not identify themselves during round-table chats, and he sometimes has to wait half an hour or more before he can confirm a call-sign! We know the feeling!

We hear that several of our readers have queried the circuit diagram of the transformerless balanced-modulator (p.314, August "SSB Topics"). The circuit as published was quite correct, and this device is in current use at G6LX, where it has replaced the more normal type balanced modulator in a phasing exciter. Yes, it does look rather like the circuit of a product detector, but you can take it that it does work as described!

G3IHI has recently joined the 80-metre sideband ranks with a big signal from the Isle of Lewis, where he is operating under the GM prefix. It seems that he is located for a short spell at the home of the 160-metre "QRM machine," the Scottish Loran station. He is using an SB-1 exciter driving a modified B2 transmitter as a linear amplifier. G3IHI puts forward the suggestion that the output choke used in the G2MA exciter provides the necessary earth return when a power/SWR bridge is used in the feed-line. He also points out that a 2.5 mH RFC connected across the feed-line will sometimes help to reduce harmonics.

It was good to hear that EI4E is again active from

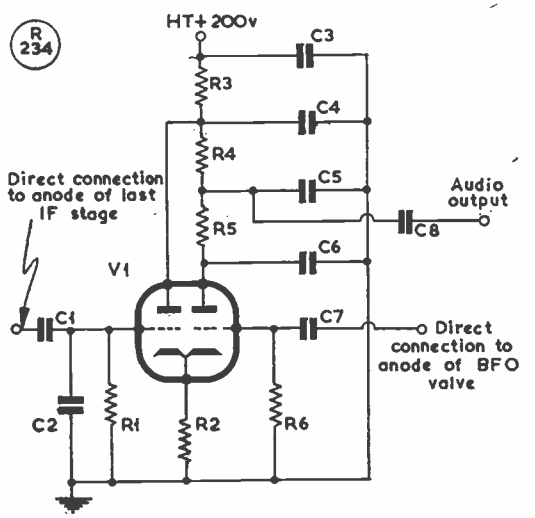


Fig. 5. Numerous questions are being asked about a product detector as an adaptor, or add-on unit, for an existing receiver. Here is a proven circuit, values for which are given in the table.

Table of Values

Fig. 5. Product Detector as Adaptor Unit

C1	= 10 $\mu\mu$F	R2	= 820 ohms
C2, C7	= 100 $\mu\mu$F, silver-mica	R3	= 15,000 ohms
C3	= 8 μF, 250v.	R4, R5	= 47,000 ohms
C4, C8	= .01 μF	V1	= 6J6 (or 12AT7; R2 then 650 ohms)
C5, C6	= 470 $\mu\mu$F		
R1, R6	= 100,000 ohms		

Killarney. At present on 14 mc, he expects to be back on Eighty later in the year.

DX and Overseas Notes

The number of countries now represented on SSB is a sure indication that an "all SSB" DXCC is only a few weeks away. At the top of the list is W2KR with 89 countries worked two-way SSB; DL4SV is a close second with a score of 86; and third is our own G3MY with 84. According to SWL Amie, the present all-time total of countries that are on, or have been on, SSB, amounts to exactly 99. The latest newcomers include: HS1A, MP4KAM, KAØFZ, ZP6WZ, KM6AX and the two expedition stations W6UOU/KS6 and OH2OJ/OHØ. It is too early in the month to know if the planned week-end jaunt to Jersey will take place, but the latest information indicates that there are "XYL difficulties" (!) that may cause the trip to be postponed. Although this is not a new country for European operators (who work 80 metres), it is of great interest to our DX readers, and for their sake we hope it will not suffer the same fate as the long-planned ON4CC/LX and VE3MR/FP8 trips, which had to be cancelled at the last moment because of licence restrictions.

During a recent visit to Italy, your scribe made a short *detour* to Monaco to check the current state of SSB activity in the Principality. As previously reported in "SSB Topics," both 3A2AH and 3A2AM

SSB COUNTRIES-WORKED LADDER

(Starting Date January 1st, 1954 — Two-Way. SSB Only)

STATION	3.5	7	14	21	28	Total
W2KR	0	0	89	0	0	89
DL4SV	18	0	82	6	0	86
G3MY	16	0	80	8	0	84
G6LX	17	4	78	46	14	82
K2AAA	0	0	81	0	0	81
W2CFT	0	0	81	0	0	81
ZS6KD	0	0	80	0	0	80
K2DW	0	0	78	0	0	78
OH2OJ	1	0	78	0	0	78
ZL3IA	0	0	76	12	6	76
ZL3PJ	0	0	75	0	0	75
VK3AEE	0	0	75	0	0	75
W3ZP	0	0	75	0	0	75
VE4NI	0	0	75	0	0	75
VE2GQ	0	0	71	0	0	71
K2GMO	0	0	65	1	0	65
W3SW	0	0	65	0	0	65
W4NQN	0	0	65	30	18	65
F7AF	0	0	60	23	7	62
VQ4EO	0	0	62	20	5	62
YU1AD	0	0	62	21	6	62
GW2DUR	4	0	60	0	0	60
GW3EHN	6	1	56	3	2	56
GW3LLU	0	0	54	0	0	54
GM3CIX	0	1	53	12	0	53
G3BXI	0	0	50	44	2	53
G3GKG	10	0	51	0	6	51
G3GKF	0	0	1	50	1	50
AP2BP	0	0	50	15	0	50
G3AOO	0	0	48	0	0	48
OZ3EA	0	0	48	0	0	48
G3IRP	5	0	37	0	0	37
G3COJ	11	0	31	0	0	36

Table corrected to September 5, 1957

were testing phasing exciters on 14 mc as far back as October, 1955. Due to pressure of work, the project had been shelved and the 3A2AM transmitter was passed to an F3 in Nice. The other exciter is now being rebuilt for multi-band working, and 3A2AH has high hopes that he will be on 15 and 20 metres by the end of the month. The expected Dutch SSB expedition to Monaco did not arrive as expected, although a licence had been granted and 3A2AH had arranged a suitable QTH with aerial masts already in position. During his visit the writer checked the bands and heard the following G stations on SSB: G2ALN, G2HQ, G3AOO, G3AUB, G3EPL, G3ILD, G5US, G8OO, GI3ZX and GM8CH. Sorry it was not possible to put 3A2AY on the air, chaps!

From time to time in "SSB Topics" reports have been published about activity from Eastern Europe. It now seems that the rumours of U.S.S.R. activity on SSB are highly suspect, as a QSL card sent to UB5KFG has been returned with a covering letter explaining that SSB has to be specially authorised for club use in the U.S.S.R. The letter also mentions that UA1DZ is the *only* Russian amateur at present active on SSB and, as far as is known, no other stations have SSB equipment ready for use. UA1DZ is there on 14 mc most evenings and has been putting an S9 signal into London. At present he has some trouble with a balanced modulator stage, which has the effect of introducing bursts of carrier and distortion products on the unwanted sideband.

The Aarland Island expedition by OH2OJ and his XYL (OH2QJ) was a great success. They were active from July 20 until August 10, and during this period contacted 260 different stations on SSB. Most of the operating time was spent on Twenty, and 37 countries were notched up before the final close-down.

SVØWE, on the Island of Rhodes, is again active on 14 mc. During a recent contact, he mentioned that he had been on Rhodes for three years and changed to sideband nearly a year ago. He finds that he can now enjoy a QSO without the constant interruptions of stations calling him while he was in contact! Another good DX station who has recently changed to SSB is CR9AH. He has been putting a wonderful signal into Europe on 14 mc during the late evenings and is very enthusiastic about his results.

VS6BE gives details (*via* CN8MM) of the proposed sideband equipment loan scheme now being organised in South-East Asia. It seems that some benefactor has donated a complete SSB transmitter for the sole purpose of stimulating interest in single-sideband! The transmitter was due to go to VS4TT on September 5 and then to VS5AT. VS2DB is next on the list with a VS1 as number four. We hope to be able to give more details about this arrangement in the next "SSB Topics."

South American activity is again on the increase; PY2JU reports that PY2BSI, PY2CK and PY2APE have joined him on 14 mc. OA4CX advises that OA4BK, CK, CX, EX and FA are active on Twenty, and OA4AS and OA5H are on Fifteen. YV5ABD is also new to SSB, as is ZP6WZ; both are on the high end of 20 metres.

G3LKO (Erith) has recently returned from Iraq and confirms our doubts about YI2RP. The real YI2RP is now G3KVX, and has never operated on SSB. Sorry, chaps, but this is one that will *not* count for the Ladder!

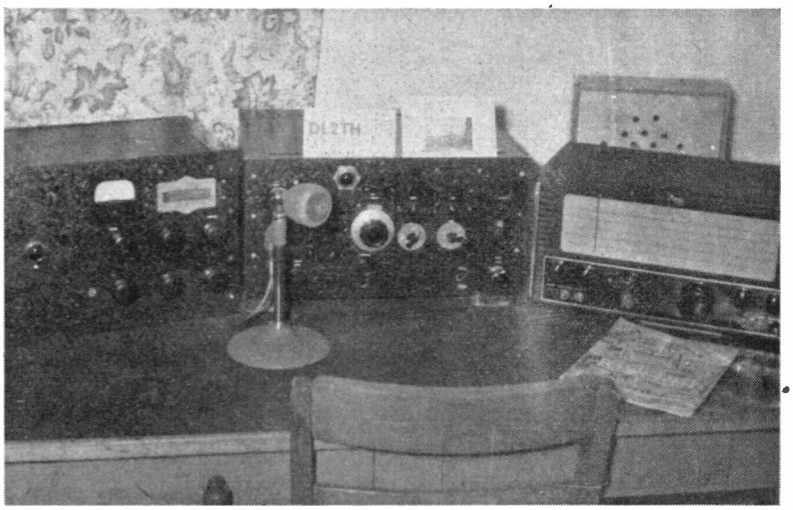
VQ4EO sends along advance details of his projected overland journey back to the U.K. later in the year. He is planning to work mobile in as many countries as he can get licences. A very full operating schedule has already been detailed, but because of possible licence difficulties in some of the countries on the route, he has requested SHORT WAVE MAGAZINE not to publish details until he has more information. (Other Amateur Radio periodicals, please note.)

KR6AF, the U.S. Air Force Club station in Okinawa, has been working into Europe during the early evenings over the "short-path" route. The

chief operator is back at the controls after a spell in hospital with severe electric burns; it seems that a faulty switch plus a flash-over on a blocking condenser put 2,000 volts on an unguarded aerial tuning unit. It just shows how careful you have to be.

Conditions between the South Pole and Europe have certainly improved in recent weeks. Two G stations chatting locally the other morning on 14 mc had quite a surprise when a break-in station announced his call as KC4USK. The surprise was even more pronounced when three more stations joined the contact.)Yes, they were KC4USB, KC4USN and KC4USW!

Thanks to W3SW *(CQ* SSB column) and to the many British and overseas correspondents for their help in preparing these notes.



When in Germany, DL2TH/DL2YL ran a husband-and-wife station, and were on SSB. At centre is the home-built sideband exciter, giving about 30 watts peak output, driving the linear amplifier (left) using three 807's in parallel. The whole transmitter assembly is band-switched for 80-40-20-15-10 metres; over 900 SSB contacts were made with this rig, and the Eddystone S.750 receiver at right. DL2TH, who was at one time VS1BQ, is now under way again as G3HSR.

Finally——

Once again, the SSB Countries-Worked Ladder has been compiled for appearance in this column, and it is much to be hoped that this time it will indeed be printed! (Yes, there it is. — *Ed.*). We are always glad to have claims for this Table, which can be sent in with the report for "SSB Topics."

Next appearance will be in the December issue, for which all correspondence is requested by not later than October 31—*GL and 73 de G6LX.*

"NEW QTH" SECTION

When sending in a call-sign/address, or a change of address, for publication in "New QTH's" and the *Radio Amateur Call Book,* please *(a)* Write it clearly on a separate slip, *(b)* Give the full postal address, and *(c)* Remember to include the actual call-sign. It seems hardly possible, but nearly every month we get people who forget to state their call—and there have even been some who have not given their own address correctly! Scribbled chits with totally illegible signatures should be avoided when it is a matter of getting a QTH into print.

"THE TECHNIQUE OF TECHNICAL WRITING"

This is a course of six lectures to be given at the Borough Polytechnic, London, S.E.1, commencing on October 11. The lecturer is Mr. G. Parr, M.I.E.E., technical director of Chapman & Hall, Ltd., the well-known publishers, who is also honorary secretary of the Television Society and a former Editor of *Electronic Engineering.* The course (the fee for which is only 10s.) will cover the whole field of writing for the technical press, including proof-reading and the preparation of material for the printer. The great majority of technical writers, professional and otherwise, are woefully ignorant of these essential processes. It is hardly realised that writing an article is one thing, but marking it up and preparing the text and illustration so that it has the expected appearance in print is quite another. It can fairly be said that many writers get the credit for work which has actually been done by a technical editor.

MULLARD ULTRASONIC ENGRAVING TOOL

The Mullard ultrasonic engraving tool, type L.274, development models of which were shown at the recent Instruments, Electronics and Automation Exhibition, has now been put into full production. The L.274 is equally suitable for engraving surfaces or for drilling small holes of any shape in hard and brittle materials like glass, ceramics, tungsten carbide, and precious, semi-precious and synthetic stones. For machining operations it may be used either as a hand tool, or mounted on the Mullard precision drill stand type E.7682. For engraving uses it can be mounted in a standard pantograph machine.

The L.274 incorporates a water-cooled magneto-striction transducer operating at a frequency of approximately 27 kc. Transducer vibration is transmitted to the cutting tool by means of a resonant step-up velocity transformer. Power for the tool is supplied by the Mullard ultrasonic generator, type L.275. This has an output of 30 watts and incorporates a feed-back system to maintain the output at the correct operating frequency without the need for manual tuning.

VHF BANDS

A. J. DEVON

Interesting Aurora Openings—

Some EDX Notes—

Results, News and Comment—

EVEN if conditions have not been particularly good during the period, they have been interesting—for we have had no less than four known Aurora openings. It is also pretty evident that Auroral conditions have been developing more frequently than suspected—that is to say, at odd times like the middle of a week-day afternoon, or in the small hours of the morning, when there is usually nobody much about on two metres to make use of the opportunity.

At any rate, for the month the known Aurora openings were as follows: September 2, 1800-1830; September 5, 0030-0130; September 22, 1630-1800; and September 23, 1500-1600. Times are in BST, and the periods approximate, in that the condition built up and faded away roughly within the limits stated.

The opening in the early hours of September 5 came at a time when most people who had been waiting about hopefully for it all the evening had given up and gone to bed; however, G8AL worked GM3BOC/A at 0100, signals having the usual Aurora characteristic, and GM2FHH had a terrific party, with DL3VJ, EI6A, G3FZL, G3HBW, G8AL, SM7BZX and SM7ZN — nice going!

September 22 was a Sunday, and the opening came at a much more convenient time, though even at that a great many people missed it, having written normal conditions off as "poor" (which they were). The peak period was 1630-1700, when the GM's were being reflected at great strength, and several Europeans were also coming in strongly *via* the north. The Scots noted and actually worked by the comparatively few G's on were GM3DIQ, GM3EGW, GM3HLH and GM6XW, between them worth several new counties to most of us; anyway, both G3HBW and G6NB go up in the All-Time by reason of the QSO's they made during this appearance. G6NB reports that GM6XW was the most consistent signal, and that after being S9 for a while GM3DIQ faded to S3 and then suddenly dropped right out; all notes had the typical T3-T4 characteristic — which GM2FHH suggests should be reported as "aur."

This brings us to the odd fact that, during the afternoon party on the 22nd, several operators were heard trying to raise the DX on phone. Under Aurora conditions, phone is *absolutely useless*, because it is totally unreadable if the reflections are very strong. The only way to make the most of Auroral conditions is to use CW, and get in quick, with short, snappy contacts kept to the essentials. These openings do not usually last long—an hour or so at most—and it will take a good operator to work (on VHF, where more search-time is involved) six or seven stations while the opening holds. The fact is, of course, that far too many VHF operators these days have given up CW altogether, even though it is as true for two metres as it still is on the HF bands that the real DX can only be worked on CW. On VHF, anyone working phone-only should hold off during an Aurora opening, because all his transmission can do is to create spitch-QRM!

Finally, on the subject of Aurora, openings can be smelt out in either of the four following ways, or by a combination of all four: A total fade-out on the HF bands can be followed 12-24 hours later by an Auroral display which may be effective at VHF; leaving a receiver more or less permanently tuned, during disturbed ionospheric conditions, to a distant signal as high in frequency as possible (say 26 mc), and noting when the beat goes very rough; watching the behaviour, during

TWO METRES

ANNUAL COUNTIES

Final Placings for Year to August 31, 1957

Worked	Station
58	G3GHO
57	G5MA
48	G3KEQ
47	*G3GPT*
46	G3DKF
45	G3LHA
42	G3DLU
41	G3KHA
37	G2CIW
35	G5ML
34	G3JWQ, G3KUH
33	G3IOO, G3JQN
32	G2DVD
30	G3CKQ, GC3EBK
27	G3IER
23	G3FUR, G3KEF, G3KPT
22	G5MR
19	G3FIH
18	G2AHY

This Table opened again w.e.f. Sept. 1st, 1957, and will run for the year till August 31, 1958. The starting figure is 14 counties worked; all operators who have 14C or more logged since Sept. 1st are eligible for entry in the Table. Claims can be made at any time, and the first sent in should list stations worked for the counties claimed; thereafter, the list can be added to as more counties accrue.

disturbed conditions, of TV and, particularly, VHF/FM broadcasting; and listening for any BBC notice about IGY conditions, given after the late-night News summary on the Home Service at 11.00 p.m. By a little sleuthing along these lines, one can be prepared for Auroral manifestations.

Tropospheric Conditions

For normal GDX working, things were quite good on September 3, improving noticeably as it got late in the evening. Some nice contacts made (or attempted) were G5MR/G6XM at 2150, with a marked echo on the latter's signals; G3KHA/G3DLU at 2220, and F8MX/G5BD on 70 centimetres. Then, on the 16th, conditions were most peculiar, coinciding with a sudden change in the weather from cold to mild, with a rising glass; all signals, even within 50 miles, had deep QSB on them, as the front swept across the country. By the late evening, the condition had stabilised, and north-south paths had developed — but by then it was too late, most people having packed up. However, G5MR was a good signal in the Midlands at 2315.

Guy of ON4BZ has been running a 100% schedule with HB1RG on Mt. Chasseral, phone both ways every evening at 2330 —they will keep at it when HB9RG is back in Zürich. Other news from ON4BZ: ON4DW has worked OE2JG (144.78 mc); QK1VR/P has been heard by ON4CP, with a good solid CW signal; HB1RG has had schedules with 11BZM and 11FA (144.3-144.5 mc), but the attempt was blighted by the fact that the I's are unable to cope on CW. As Guy so rightly says, "This is the big drawback"!

European VHF Contest

This was scheduled for the week-end September 7/8 and, probably, the less said about it, the better! Conditions were flat, activity very low, and interest in the contest almost negative. By 2240 GMT on the 7th, F8MX had only worked 20 stations, and was saying that he could hear nothing from ON or PA. By the late afternoon of the 8th, G2XV had made it 43 worked, averaging about two QSO's an hour over the contest period. Some near-EU's were getting into the London area, and F8MX was a good, workable signal for most of the time—but otherwise, nothing.

The Year's Result

The only table we show this time is Annual Counties for the last twelvemonth, with 24 stations listed, and G3GHO just in front of G5MA, for first place. This compares with 31S in the table for the 1955-'56 season, when only 48 counties were worked by the leader (G5MA).

If this means anything, it is that conditions have been better generally this year than last, but activity has been lower. Probably, readers would agree that this just about reflects the true state of things.

Annual Counties is open again for the next twelve months, and already we have a few claims in for the first list, to appear in the next issue if the number of entries justifies it; anyway, we hope that all active operators, and in particular the newer stations on the two-metre air, will come in on this one. All other Tables will be brought up-to-date for the next issue, so let us have any claims outstanding.

VHFCC Elections

Two to record on this occasion: VHFCC Certificate No. 218 goes to G3KHA, R. V. Hinchcliffe, Bristol, 4, who showed in his batch six cards for contacts made on 70 cm. No. 219 goes to OZ3A, Svend Jershauge, Odense, whose claim must be unique in that he

TWO-METRE ACTIVITY REPORT

Lists of stations heard and worked are requested for this section, set out in the form shown below, with callsigns in strict alphabetical and numerical order.

G2HDR, Stoke Bishop, Bristol.

WORKED: G3ARX, 3FIH, 3FKO, 3HHY, 3IER, 3KHA, 5DW, GW8UH, 8UH/P.
HEARD: G5MA, 5YV.
(*August* 18-*September* 16).

G3KHA, Knowle, Bristol.

WORKED: G2ANS, 2CIW, 2CPX, 2DTO/P (Epsom), 2HDR, 2JF, 2JM, 2WJ, 2XV, 2YB, 3BA/P, 3CBU, 3DLU, 3DOR, 3FIH, 3FKO, 3FP, 3FWW, 3FZL, 3GHI, 3GHO, 3GNS/P, 3GOZ, 3GQK/P, 3HBW, 3HHY, 3HHY/P, 3IAM, 3IIT, 3IJB, 3ION/P, 3IRA, 3IRA/P 3IRS 3JTQ/P, 3JZW/P, 3KEQ, 3KSR/P, 3LTF, 3XC, 3XC/P, 4DC, 5DF, 5DW, 5WW, 5YV/P, 6AG, 6NW, 6OX/P, 8AL, 8DA, 8QY/P, 8UQ/P, 8VZ, GW3HAW, 8UH, 8SC, 8SC/P.
HEARD: F8MX, G2AHP, 2AUD, 2BMZ, 2DDD, 2DVD, 2GG, 2NM, 2UJ, 3BA, 3BII, 3CGQ, 3EGV, 3FAN, 3FCQ, 3FEX, 3HXS, 3JMA/P, 3LOA 4HQ, 5MA, 5RD, 5UF, 6FO, 6JK, 6NB, 8KW, 8SK, GB3IGY.
(*August* 12-*September* 11).

SWL Woodhouse, Storrington, Sussex.

HEARD: F8MX, G2AHP, 2AHY, 2AIH, 2ANT, 2AUD, 2BDP, 2BZ, 2CDB, 2CIW, 2CPX, 2DDD, 2DSP, 2DTO/P (Epsom), 2DUS, 2DUS/P (Baldock), 2DVD, 2FNW, 2HCG, 2HDJ, 2NM, 2QY, 2TP, 2XV, 2YB, 3BA, 3BFP/P (Hog's Back), 3CBU, 3CGE, 3CGQ, 3DKF, 3DLU, 3DOR, 3EJO, 3ERD/P (Nr. Derby), 3FAN, 3FD/P (Dunstable), 3FEX, 3FMO, 3FQS, 3FRG/P (Nr. Storrington), 3FUR, 3FZL, 3GDR, 3GHO, 3GKZ, 3GNR/P(Devil's Dyke) 3GNR/A (Bushy, Herts), 3GQK/P, 3HBW, 3HCU, 3HZJ, 3IAM, 3IBI, 3IIT, 3ION, 3ION/P (Nr. Shaftesbury), 3IRA/P (Nr. Swindon), 3IRS, 3IUL, 3JEP, 3JFR, 3JHM, 3JMA/P, 3JR, 3JTQ/M, 3JWQ, 3JXN, 3JZN, 3JZW,3KAG/P(Derby), 3KEQ, 3KEQ/P (Nr. Guildford), 3KHA, 3KQC, 3KSR, 3KSR/P, 3LHA. 3LHA/P (Nr. Coventry), 3LIM, 3LOA, 3LOK, 3LTF, 3PV, 4KD, 5BD, 5DS, 5HN, 5LK/P (Redhill Common), 5NF, 5PP/P (Nr. Coventry), 5WW, 5YV, 5YV/P (Nr. Dorking), 6AG, 6JK, 6JK/P, 6JP, 6NB, 6NW, 6OX, 6OX/P (Spanhead), 6XM, 6XM/P (Nr. Leicester), 8KW/M (Dorset), 8LM/P (Herts), 8SB/P, 8SC, 8SK, 8UQ/P, 8VZ, GW8UH.
(*August* 7-*September* 8).

SWL Tomlin, Malvern, Worcs.

HEARD: F8MX, G2AK/M, 2AHY, 2ATK, 2AUD, 2DCI, 2FNW, 2HGR, 2JF, 2NY, 2YB, 2YM, 3AGS, 3ATZ, 3AYT/M, 3BA/P, 3BW, 3CCH, 3ENY, 3ERD/P, 3FD/P, 3FUW, 3FW, 3GGR/P, 3GKZ, 3GMN/P, 3GNS/P, 3GSO, 3GYV/P, 3GZM, 3HBW, 3HII/P, 3HTY, 3IER, 3IOO, 3IRA/P, 3IWJ, 3JGY/M, 3JQN, 3JWQ, 3JWQ/P, 3JZG, 3JZN, 3KAG/P, 3KBS/P, 3KEQ, 3KFD, 3KFT, 3KSR/P, 3KUH, 3LHA, 3LDW, 3MA, 3NL, 3WW, 3YZ/P, 5MA, 5ML, 5PP/P, 5YV, 6AG, 6SN/P, 6XM/P, 6YP, 8SB/P, 8QY/P, 8UQ/P, GB3SP, G13GXP, GW8UH/P, ON4BZ.
(*August* 1-31).

G3KUH, Rotherham, Yorks.

WORKED: G3ATM, 3EHK, 3GFD, 3GHO, 3GSO, 3IRA, 3IVF, 3JQN, 3JWQ, 3JXN, 3KEQ, 3LHA, 5BD, 5DS, 5MA, 5YV, 6XM, 8VZ.
HEARD: G2HCG, 4MK, GI3GXP, GM3EGW.
(*August* 25-*September* 15).

G3KUH/P, Nr. Bowness, Westmorland.

WORKED: G2NY, 2BBU, 2HCJ, 3HWS, 3HWS/A, 3IKV/A, 3IWJ, 3JAH, 5YV.
HEARD: G3GZM, 3KJA/A.
(*September* 7-12).

SWL Winters, Melton Mowbray, Leicestershire.

PHONE: G2BVW, 2CRL, 2FMO, 2FNW, 2HCG/M, 3DKF, 3EGE, 3FDF, 3FUR, 3FUW, 3GSO, 3IVF, 3JWQ, 3JXN, 3LHA, 3LHW, 3LKA, 4MK, 5ML, 5PP, 5YV, 6XM.
C.W. G2FNW, 3ERD/P, 3GSO, 3JWQ, 3KAG/P, 5YV, GB3IGY. (*August* 19 *to September* 16).

70 CENTIMETRES ONLY

G2CIW, Cambridge.

WORKED: F8MX, G2DUS, 2XV, 3HBW, 5KG.
HEARD: G5BD, 5UM.
(*September* 6-16).

gets his VHFCC with only two G's—G5BD and G5YV. His other cards to make up the 100 include 79 OZ's, all worked in the course of contests in the last four years, the balance being DL's, LA's and SM's. The interesting thing about this is, of course, the unexpectedly large number of OZ's it discloses as being available on two metres.

Three-Band VHF Station

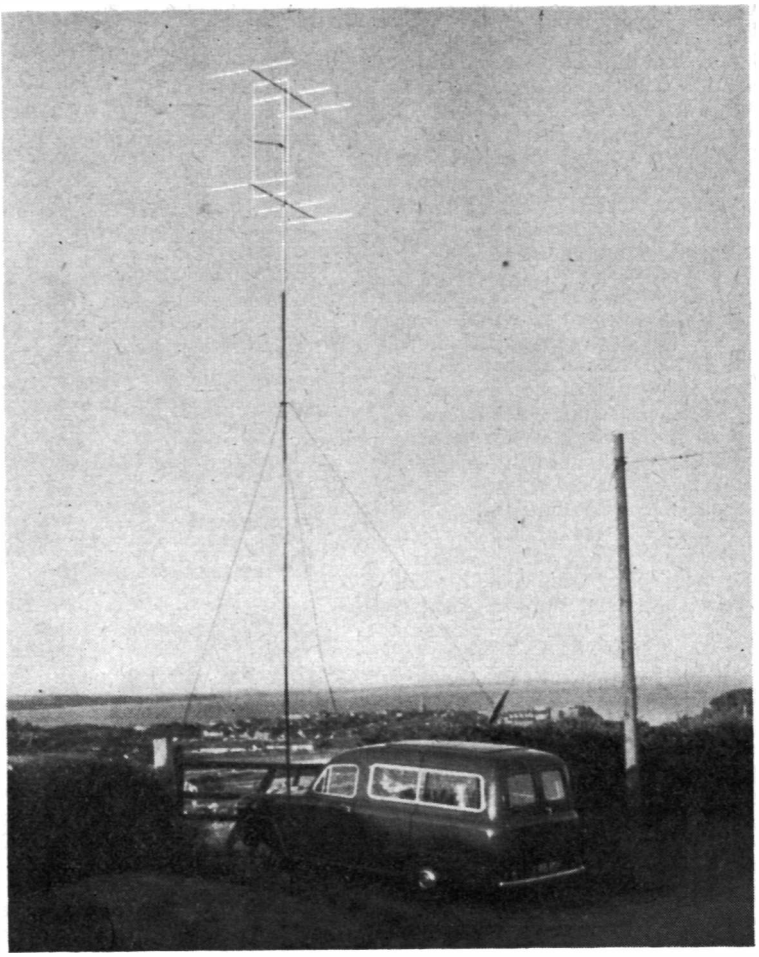
G3HBW (Bushey, Herts.) is now on regular schedule, each evening from 2030 clock-time, with G5BD (Mablethorpe), the path-distance being 125 miles. Arnold starts on two metres, then changes over to 70 centimetres, and then to 23 cm. Contact is 100% on 144 mc, pretty regular on 430 mc, while on 1300 mc Arthur has not yet made a positive identification, though on the evening of September 20, it seemed that the 23 cm signal might have been getting there. G5BD is, of course, in a receiving condition on all three bands, and can transmit on 144-430 mc.

Some Station Reports

These must be covered rather briefly this time: G3KEQ got GM6WL/P for Wigtownshire on the "bright evening" of September 3, but G3GHO could not make himself heard up there. G2CIW is now at 14C and three countries on 70 cm, and has had a phone QSO on that band with F8MX.

G3KUH (Rotherham) remarks that his /P expedition to Westmorland was "rather a dismal affair"; only 10 stations were worked in 13½ hours over four evenings; his pin-point was NGR 34/430965, and the Tx ran a 6C4 modulated by a 6BW6, with an ON4BZ-type converter into an S.640, and the beam a 4-ele flat-top. G3KUH/P says he will have another trip, to try and do better.

For G3KHA (Bristol) it has not been a good year in terms of GDX, neither EI, GD nor GI even being heard; he is one of those who looks for DX on CW, and is always ready to put in the key. G3JQN (Croydon) says that, for him, the year has been his best yet, with 35C and 9 countries worked, and he has enjoyed it all, including his /P trips with G3KEQ.



This striking photograph is of the GW3KEQ/P set-up near Tenby, Pembrokeshire, in July, with a clear getaway to the east, over the sea. Several Home Counties stations were worked from here on two metres, under conditions which could not be called good.

We also acknowledge brief reports, claims and comments from: F8MX, G2HDR, G3AGS, G3DLU, and SWL's Winters and Woodhouse.

Six Metres

In addition to ZE2JE, transmitting regularly on 50.75 mc and asking for SWL reports (and hearing European TV out there!), VQ4EV (Nairobi) is now on 50.25 mc, also looking for cross-band 6/10 contacts with U.K. stations. To receive 6 metres, all one needs is an RF-26 unit and 3-ele beam with elements cut to R-116 ins., A-110 ins., and D-105 ins., spaced 46 ins. between elements.

Of our own 70 mc (4-metre) band, we go on having no news! . .

Dead-Line——

There is time for us all to catch our breath before the next issue is due, for which the closing date must be **Wednesday, October 23.** Now, don't bring your report to the *Magazine* stand at the Amateur Exhibition (for your A.J.D. will not be there), but send it, as usual, to the only address: A. J. Devon, "VHF Bands," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1. With you again on November 8 — and keep watch for the Aurora.

Substituting for the 6AG7

IN THE MULTI-BAND EXCITER

B. WARDMAN (G5GQ)

In the March-April 1956 issues of SHORT WAVE MAGAZINE *our contributor described a switched VFO-Exciter unit, in which one preferred valve was a 6AG7. As this has proved difficult to obtain, he discusses here not only the possibility of using a 6AC7 instead, but also some of the factors involved in the substitution of valve types and their running under conditions outside makers' specification.—Editor.*

WHERE to get hold of a 6AG7? That has been one of the problems shot at us after the appearance of notes on multi-band VFO design (*Short Wave Magazine*, March-April, 1956). Yes, the 6AG7 is certainly a delightful valve—9 watts anode dissipation, high slope, good oscillator at high frequencies—but there is no doubt that it is in short supply. So, many people have been unable to get hold of them, or else are worrying about what is going to happen when their solitary one departs this life.

In view of this, quite a bit of work has been done at G5GQ trying to find a satisfactory replacement for V2 in the original circuit, and by "satisfactory" is meant that either the original 6AG7 or the substitute can be plugged in at will without sacrificing too much. But, try as one may, something has to be sacrificed, and this has been kept to the minimum : It is the calibration. However, even on the highest frequency band, 28 mc, the difference is only about 50 kc which, *on a percentage basis*, is infinitesimal. On the other bands it is, of course, proportionately smaller. This change is positive, *i.e.*, an increase in frequency, so that with the recommended alternative what used to read 28000 kc would now be about 28050.

The substitute recommended is the type 6AC7, the use of which will require one or two very minor circuit alterations. However, as no doubt readers will want to try other possible substitutes, let us run over briefly the principles involved in this type of alteration.

Recording Initial Performance

The very first thing to do is to record the performance of the original outfit. For heaven's sake, don't rely on memory, but *write down* the original meter readings, the alterations made, and the final meter readings. That is the only way a proper comparison can be made. Far too often we are inclined to rely on semi-guess work. We use a flashlamp bulb and try to memorise the brightness on the various bands, and then hope to compare this with the brightness noted with a modified circuit hours or even days later: it's just impossible ! So, to repeat, before starting anything, note the existing performance.

What should be recorded ? Well, there are two things liable to be altered, the frequency calibration, and the power output. Noting the first is easy, just the usual dial readings for band-edge on each band.

Assuming that the unit is working satisfactorily at present, *i.e.*, ample power output on all bands, then the second is also straightforward and should comprise the following anode current readings *on all bands*:

(a) The anode current of the QV04-7 *off-tune*.
(b) The anode current of the QV04-7 on tune.

these being especially important.

For record purposes, it is advisable to note both the screen and anode current readings of the 6AG7, again both off and on tune.

Since we are only changing the 6AG7, why on earth play round measuring up the next valve : surely this is a bit unnecessary ? Not at all, it is the second valve reading which is vital, and for the following reason: The main thing we are going to worry about is whether the substitute VFO valve (be it the 6AC7 suggested or any other type which you want to try) has enough kick to drive the following stage. By measuring the anode current of that second stage, we also indirectly measure the amount of drive it is actually receiving from the VFO.

Turning back to the original circuit (p.13, March, 1956), it will be remembered that fixed bias was recommended for the driven valve, V3 in the circuit. Indeed, with no drive applied, this valve should be biassed to cut-off and should take no anode current. Then, as drive is applied, with the oscillator anode tuned to resonance, RF volts will appear at its grid, effectively producing a positive DC bias which, as it builds up, overcomes the fixed negative bias and so encourages the valve to take anode current. Therefore, the more anode current this QV04-7 valve draws *off* resonance, the

more drive it is receiving. Tuning it to resonance results in a very marked dip, the difference between off-resonance and maximum dip readings being some measure of indication of the "goodness" of the output tuning circuit; on the higher frequency bands, this difference will be less. Typical figures for the QV04-7 are given in Table I.

With a set of figures like those shown, one can really start planning. Assume the unit has been giving sufficient power on all bands to drive a 150 watt PA satisfactorily. Then it can be deduced at once that any substitute VFO valve, which would give anything approaching the "off resonance" readings recorded, should make a fairly satisfactory change. Again, if the original VFO unit had output to spare, we could reduce power to the 6AG7 and measure the minimum drive, *i.e.*, off-resonance milliamps to the QV04-7, required for our needs. We might well find that we could go down by nearly 10 mA on each band. So, from these readings, we find two things:

(1) A recognisable figure for the level of output the new valve should give,

(2) An estimate (or, if a reading is taken, a definite figure) indicating the minimum output required from it.

Understanding the meaning of measurements is one of the most important arts in radio, for it can direct one straight to the source and save hours of time. Hence this illustration is stressed because it applies so very often in amateur transmitting stations.

Changing the Valve

Now we are changing over from a 6AG7 to a 6AC7, and the first thing to do is see that we don't exceed the maker's rating. The essential difference between the two valves is in power handling, the vital statistics being as shown in Table II.

Note the screen rating on the 6AC7; it must *not* be connected directly to a 300-volt supply. Further, we must be most careful about the lower screen dissipation. First, the 6AC7 was checked with 150 volts on the screen. Off resonance, the screen milliamps tried to hit up to 10, *i.e.*, about 1·5 watts screen input. At the same time the anode current was about 3·0 mA—yes, less than the screen! That's the sort of thing that happens with oscillators, so don't assume that screen current is always less than the anode mA.

It is quite clear that, with this circuit, the 6AC7 cannot have its screen *directly* connected to any supply voltage with safety. The answer is a 50,000-ohm 1-watt resistor, partly to act as a voltage dropper and partly as a protective resistance. It will, of course, mean less output when using a 6AG7, but the drop is too small to matter; indeed, in most cases the output is already too high so that if anything the addition of this extra resistance is an improvement. This 50,000-ohm resistance should be inserted in series with the wiper contact of P1 (in Fig. 4, page 13, March, 1956 issue *Short Wave Magazine*).

TABLE I

Typical QV04-7 Anode Current Readings
Anode Volts: 350
Screen Volts: 200

BAND	CURRENT OFF RESONANCE	CURRENT AT RESONANCE
1.8 mc } 3.5 mc }	60 mA	12-15 mA
7.0 mc	60 mA	15-18 mA
14.0 mc	60 mA	15-20 mA
21.0 mc	55 mA	20-25 mA
28.0 mc	50-55 mA	20-27 mA

With this slight addition, the screen dissipation of the 6AC7 should be within maker's rating. The actual efficiency of these low-power stages is very difficult to measure with ordinary amateur equipment, but we should not be too conservative if we allowed about 33%. On that assumption, we could go up from the maker's rating of 2·8 mA at 150 volts to just above 4·0 mA, remembering that as the current rises, so the voltage drops across the resistor, thus keeping screen grid input power down. And in practice, it will run at just about that figure.

Maltreat Valves Properly!

After what has gone before readers may well raise their eyebrows at this—but it happens that one of the writer's jobs during the war was to stop the maltreatment of valves in Service use, so the reasons for this apparent contradiction may help in the selection or substitution of other types.

Valves are designed by their makers for specific purposes. Thus a receiver HF pentode is intended for that particular purpose and tested in production for that use. It may, and probably will, work in a low power audio

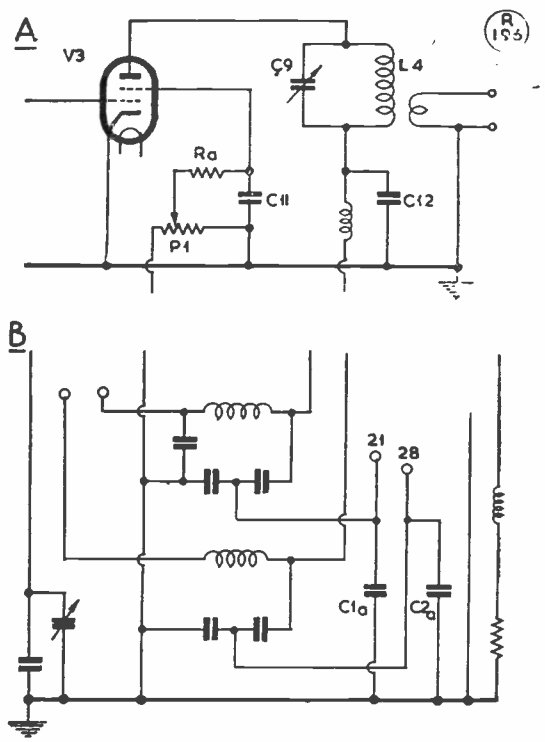
stage also, but the makers do not *recommend* it for that job because it has neither been designed nor tested for it. For example, under audio conditions, some of the production may show signs of hum, and makers do not want to have the bother of doing a special test for this and then finding that a large percentage have failed it. It is cheaper for them to produce a special version for audio applications. But the average amateur is in a different position; like the writer, he will happily use an EF50 as an audio valve and cheerfully face the risk that as many as two out of three will be too noisy for that job. But with a good stock of these, it's an easy way out.

Turning to the 807, there we have a valve designed for transmitting. It has been pumped hard, and has a grid meant to run positive. Provided the dissipation is kept within limits, *i.e.*, efficiency maintained, and the total cathode current not exceeded, the valve is unlikely to blow up under 1,000-volt CW or NBFM conditions. It does, of course, entail watching the screen and grid voltages carefully, and ensuring that cathode current does not exceed maximum rating. There will be a slight reduction in life, but not enough to worry about. By accident, during the war, a fairly large number of these valves was given just on 3,000 volts on screen and anode, and stood up to it remarkably well. (But anode modulating it as well would be a bit *too* cruel !)

The 6AC7 is quite a different kettle of fish. It is a high slope receiving pentode, with very close-spaced electrodes, definitely not intended for having its grid run positive. Therefore, if the screen dissipation is exceeded, we are likely to run into overheating and emission from it, and this in turn will overheat the grid which would also start to emit. The consequence would be that milliamps would go out of all reason, and the valve go soft. In general, valves of that type are not designed to cope with such conditions; there may well be a few grains of emitting material which have spluttered on to the grid and screen electrodes

TABLE II

VALVE	6AG7	6AC7
Max anode dissipation	9 w.	3 watts.
Max screen dissipation	1.5 w.	0.38 watts.
Max screen volts	300v.	150 volts, or max. 300 volts supply plus dropper.



(A) shows the additional 50,000-ohm 1-watt resistor Ra, fitted in series with the slider of P1. (B) the condensers C1a, 150 $\mu\mu$F approximately, and C2a, of about 100 $\mu\mu$F, fitted to the 21 and 28 mc switch contacts, as explained in the text. These condensers should be of the silver mica type. (A) is part of the circuit round V3 in Fig. 4 of the March issue, and (B) is the relevant part of Fig. 6 on p.73 of the April, 1956, issue of "Short Wave Magazine."

so that, when these overheat, emission takes place. Valves meant to run positive (as for transmitting purposes) have their electrodes specially treated to avoid this. Again, transmitting valve electrodes are treated (in conjunction with the pumping) to re-absorb a small amount of gas which is driven from them under such conditions, whereas the receiving valve is not. In general, receiving valves are much stronger than their makers' claim (as our misuse of them proves), but the point is that even maltreatment should be applied with some modicum of reason. So, to repeat, watch the screen and control grid heating, plus the total cathode current, and you can get away with murder—almost.

RF Circuit Alterations

Having dealt with what might be called the physical aspects of changing over the VFO valve, there remain the RF ones. As the original circuit stood, or rather as its values

were, the 6AC7 would only oscillate weakly for 21 mc output (5·25 mc fundamental) and not at all for 28 mc. The solution of this, very easy, is to alter the degree of feedback by increasing the value of C2 for those two bands. Turning to p. 73, Fig. 6 of the April issue will show the values and where the original C2 condensers went. Again, turning to the suggested switch layout recommended in Fig. 8a, p. 75 of that same issue, it will be seen how very easy it is to get at the unit and add two additional fixed silver mica condensers, strapping one each respectively across the existing 28 and 21 mc C2 capacities (cathode to earth). About 100 $\mu\mu$F extra for 28 mc and about 150 $\mu\mu$F for 21 mc should be about right, but will vary slightly with individual layouts.

Increasing the value of C2 on these bands alters the frequency *very* considerably, making it much lower by as much as 300 kc. Therefore, realignment of the VFO grid coil will be necessary, and if it is beyond range of the tuning slug, then up to 2 turns may have to be removed from each coil. Note that the larger C2 is made, *i.e.*, the bigger the extra capacity put across it, the greater becomes the change from the original frequency: at the same time, within reason, the greater the ease of oscillation. As at these frequencies the circuit layout and construction is probably the controlling factor, and will vary considerably from case to case, a little experiment is justified to obtain the best balance over the complete bandwidth. Don't, for example, try C2 *plus* at 28 mc only: You may find, for example, that 150 $\mu\mu$F extra gives apparently much more output than does 100 $\mu\mu$F. Tuning to 30 mc, however, may show quite a different picture with output well down.

Again to summarise, add the extra capacity and check both ends of the *new band it covers* before doing any coil pruning. Then, having pruned it, you should find only the slight frequency difference mentioned at the start by using either the 6AC7 or 6AG7 at will.

Insufficient Output

In practice, no appreciable drop in output has been noticed in the writer's unit. But if there is a slight drop, and provided the VFO is giving somewhere near the drive figures to the QV04-7 measured initially, then this slight loss can be made up by improving the anode circuit of the following valve, V3. In the author's version, there was more than sufficient output for his purposes, so the simple anode coils used were quite satisfactory (even though they were inclined to get very slightly warm). Therefore, substitution of a heavier gauge, self-supporting coil, for L3 on each of the two bands 21 and 28 mc should give up to 50% more output.

IMPROVED PRESET POTENTIOMETER

The introduction to the commercial market of an economically priced preset potentiometer which provides the reliability and performance of a moulded track, yet costs no more than existing sprayed track types of control, is announced by The Plessey Company Limited.

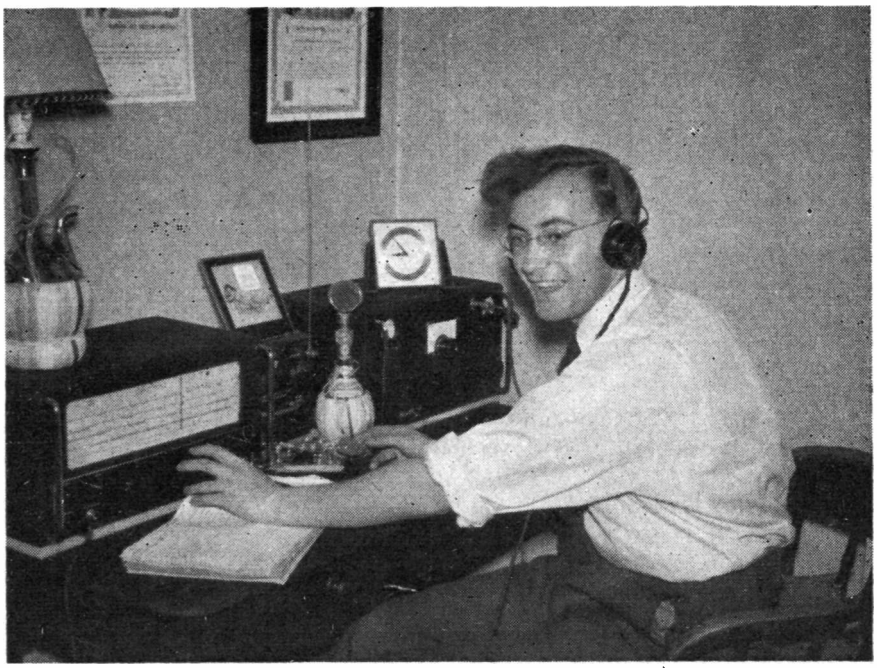
Basically, the method of construction consists of moulding the track directly on to a low cost insulant. Known as the type "PP" preset potentiometer, a development of the well-known Plessey type "EP" moulded track control, it fills the need for an equally efficient, yet cheaper, control suitable for applications where precision and low noise-factor are essential. In general, the "PP" control retains the same physical dimensions and features of the latter, such as simple fixing by 6 BA screws not more than ¼ in. longer than the panel thickness, and integral moulded knob. Retention of the moulded knob allows operation on AC/DC equipment, thereby providing an additional safety feature. Another important advantage is that complete reliability under arduous working conditions is assured by carbon-to-carbon contact.

Rated at a maximum of half-watt over the entire resistance element, the type "PP" control is being manufactured in the normal resistance range 1,000 ohms to 2 Megohms, with a tolerance of ±20%. It is particularly suitable for use in export equipment, having passed tropical exposure tests to RCS 122A Grade H3.

GROWTH OF TV VIEWING

The G.P.O. compile and publish a *Quarterly Return of Broadcast Receiving Licences*, which consists of a great deal of statistical data of considerable value to those planning sales coverage schemes. In the first quarter this year, overall increase in TV licences for the three months to March 1957 was 396,159, the total then being 6,966,256. The details are broken down to counties and even towns, and the trends in Sound/TV licensing are also shown. For instance, for Wales, the town with the smallest number of TV licences is Blænau Festiniog, with 119, whereas Newport, Mon. has 50,897. In London, the S.E. Postal District has the largest number of licences, and for Scotland Glasgow has 149,059, whereas Edinburgh shows 60,609. It is also shown that there are now 130 towns and postal districts where the number of sound and TV licences exceed those for sound radio only. The *Quarterly Return of Broadcast Receiving Licences* can be obtained on application to the G.P.O. Accountant-General's Dept., Ledger Branch III, 12-15 Finsbury Circus, London, E.C.2, price 15s.

THE OTHER MAN'S STATION



G3JEG

IN August, 1953, at the age of sixteen and a half years, G. B. Marston, Eilansgate House, Hexham-on-Tyne, Northumberland, was issued with the call-sign G3JEG, after spending several years as an enthusiastic short-wave listener—always the right way to begin in Amateur Radio.

From the very commencement, the lower frequencies have always been his main interest, and still he gets more pleasure from working inter-G stations or Continentals rather than chasing elusive DX—and on CW at that.

The transmitter runs 150 watts input and is band-switched 3.5 to 28 mc. It consists of a Geloso signal shifter, with a KT66 output stage driving the "traditional" pair of 807's in parallel in the final stage. Various systems of keying have been tried in recent months, and the most satisfactory method seems to be PA keying, with suitable key click elimination. The transmitter is pi-coupled into a multi-band dipole which runs east/west and is approximately 50 feet high at one end, sloping to 30 feet. On 21 mc, however, a half-wave dipole is used. Slight TVI is experienced on bands above 14 mc, but below this the transmitter is free of interference.

About 95% of the operation at G3JEG is done on the key, but for local and semi-local contacts a small screen modulator—consisting of a crystal microphone (in the Chianti wine bottle) and 6SJ7-6SN7-6L6 speech amplifier, located below the operating table—proves adequate, giving satisfactory quality and full modulation at reduced carrier level.

For band-edge checking and frequency measurement, a Class-D wavemeter modified for mains operation is used. The receiver is an Eddystone 840A superhet; a fully relay-controlled send/receive system is operated from a switch on the receiver. All the station power supplies are located in a steel case beneath the table.

Most of the present activity is on 7 mc CW, but G3JEG says he can "claim to have worked no real DX." However, he holds a WAC certificate for 14 mc and the SHORT WAVE MAGAZINE WABC certificate for 1.8 mc. Another of the parchments is a code proficiency certificate, for 35 w.p.m., issued by the ARRL.

G3JEG is employed as a marine radio officer, and in his travels has been able to lay hands on items of radio interest which are not normally available in this country—for instance, his bug key is an American "Vibroplex" and the test instrument was bought in Japan.

VHF STATION AT LLANGOLLEN

The BBC announces that a new VHF sound broadcasting station for North-East Wales will be built on a site 1,800 ft. above sea level at Cyrn-y-Brain, near Llangollen, and some eight miles west of Wrexham. The station will be known as Llangollen. It is expected that it will be completed by the autumn of next year.

Llangollen will be the fourth BBC VHF sound broadcasting station to be built in Wales.

NEW QTH's

This space is available for the publication of the addresses of all holders of new U.K. callsigns, as issued, or changes of address of transmitters already licensed. All addresses published here are reprinted in the quarterly issue of the "RADIO AMATEUR CALL BOOK" in preparation. QTH's are inserted as they are received, up to the limit of the space allowance each month. Please write clearly and address on a separate slip to QTH Section.

G3JWT, F. E. Warner, 14 Pitts Road, Slough, Bucks.

GI3KSY, J. F. McKinney, 7 Cross Street, Waterside, Derry.

G3LIC, C. L. Roome, 9 Cromford Road, Chaddesden, Derby

G3LIT, K. Worrall, 74 Blackbourn Spring, Harlow, Essex.

G3LNH, S. S. Taylor, 38 Linthorpe Grove, Willerby, Hull, Yorkshire.

G3LQX, M. A. Nicolaides, 59 Lacey Street, Ipswich, Suffolk.

G3LRV, Capt. L. Harking, Sig. Pltn., 4th Bn. East Yorkshire Regt. (T.A.), Londesborough Street Barracks, Hull, Yorkshire.

G3LSS, L. Scofield, 47 Ivanhoe Drive, Kenton, Middlesex.

G3LUL, C. D. Harrington, 75 Tewson Road, Plumstead, London, S.E.18.

G3LUQ, F. Wickins, Chanctonbury, Woodland Grove, Claverton Down, Bath, Somerset.

G3LVW, R. Smith, Roker Private Hotel, 503 New South Promenade, Blackpool, Lancs.

G3LVW/A, R. Smith, 137 Clifton Drive, Blackpool S.S., Lancs.

G3LVX, E. Derrick, 407 St. Helens Road, Bolton, Lancs.

G3LVZ, D. Jackson, 11 Back Lane, Sileby, Loughborough, Leics.

G3LWA, R. J. J. Hicklin, 13 Clive Road, Heath Park, Romford, Essex.

G3LWB, R. V. Moore, B.Sc., 30 Abbey Crescent, Beauchief, Sheffield, 7.

G3LWC, M. Butchart, Mickfield, Stowmarket, Suffolk.

G3LWF, L. R. Franklin, 55 Newbridge Road, Bath, Somerset. *(Tel.: Bath 78223).*

G3LWI, S/Sgt. J. D. Francis, 1 Married Qtrs., Royal Signals, Woodhouse, nr. Loughborough, Leics.

G3LWI/A, J. D. Francis, 19 Johun Grove, East Barnet, Herts. *(Tel.: Barnet 1256).*

CHANGE OF ADDRESS

DL2BH, S/Tech. Dewar, AMQ 162, R.A.F. Oldenburg, B.F.P.O.25, Germany.

GM2HII, R. S. Ashley *(ex-G2HII),* 45 Castle Road, Causewayhead, Stirling.

G2WD, G. McLean Wilford, c/o Barclays Bank D.C.O., Broad Street, Bridgetown, Barbados, B.W.I.

G3AUU, A. J. Hill *(ex-VS1FH),* 23 Horner Road, Taunton, Somerset.

G3DGS, International Aeradio Ltd. Social Club, Engineering Division, Hayes Road, Southall, Middlesex.

G3DOZ, J. D. Smith, Woodside, Kearton Close, Kenley, Surrey.

GM3EFS, W. H. Borland, c/o 128 Dalmeny Avenue, London, S.W.16.

G3EGH, K. M. Hodgson, 14 Fairfield Avenue, Normoss, Blackpool, Lancs.

GM3EGW, J. F. Shepherd, 8 Garvock Hill, Dunfermline, Fife.

GW3FSP, D. E. Davies, Glanmor, Brynna Road, Pencoed, Bridgend, Glam.

G3GKI, V. Kershaw, 57 Hunt Lea Avenue, Lincoln, Lincs.

G3GTM, P. Morey, White Hart Inn, Bridestowe, nr. Okehampton, Devon.

G3HBI, R. J. Brooker, 25 Wigmore Road, Tadley, Basingstoke, Hants.

GI3IFD, T. Carlisle, 41 Thorndale Square, Carrickfergus, Co. Antrim.

G3IUX, E. R. Rose, 2 Sea View, Ilkley Road, Barrow-in-Furness, Lancs.

G3JDG, D. Gibson, 5 Edward Close, St. Albans, Herts.

G3KAY, 4010943, F/Sgt. Lang, Sgt.'s Mess, R.A.F. Ruislip, Middlesex.

GM3KHH; W. G. Cecil, 74 Mid Street, Keith, Banffshire.

G3KHT, Sgt. N. James, c/o Sgt.'s Mess, R.A.F. Station, Henlow, Beds.

G3KIJ, E. F. Lugmayer, 70 Lion Road, Edmonton, London, N.9.

G3KJQ, D. J. Garner, Tree Tops, Beechwood Drive, Marple, Cheshire.

G3KQH, J. R. Hunt, 57 Woodland Avenue, Overstone, Northants.

G3KXS, H. J. H. Perry *(ex-GM3KXS),* 30 Home Close, Harlow, Essex.

GI3KYP, A. D. Patterson, 116 University Avenue, Belfast, N.I.

G3LTA, B. N. Brassett, 354 Park Road, Loughborough, Leics.

G4HZ, E. C. W. Beale, 3 Orchard Road, Altrincham, Cheshire.

G5QL, L. Herrington, 141-B Hertford Avenue, West Kildonan, Winnipeg, Manitoba, Canada.

GC6FQ, Lt./Col. P. A. Northey, La Botillerie, St. Ouen's, Jersey, C.I.

G8KC, H. Longuehaye, Aorangi, Beech Road, Tokers Green, nr. Reading, Berks.

CORRECTION

GW3CIJ, W. R. Petheram, 11 Henfaes Road, Tonna, Neath, Glam.

THE MONTH WITH THE CLUBS

By *"Club Secretary"*

(Deadline for November Issue : OCTOBER 18)

The Twelfth *Magazine Club Contest* takes place on November 16-17 and November 23-24, and by now many Clubs will be preparing for this annual event. Aerials are, perhaps, the most important factor, apart from operators—and probably both are in the process of being smartened up!

There have been no changes whatever in the Rules (shown here) since last year's event, but we do urge all those concerned to *read* them, carefully, with particular reference to paras. 3 and 6. In the past the logs have not all been set out according to the very precise instructions in para. 6, and this year the adjudicators will be tougher in this respect—to the extent of disqualifying Clubs whose logs are not set out as required. For one thing, unless logs are reasonably uniform, it is almost impossible to check them properly in the time available.

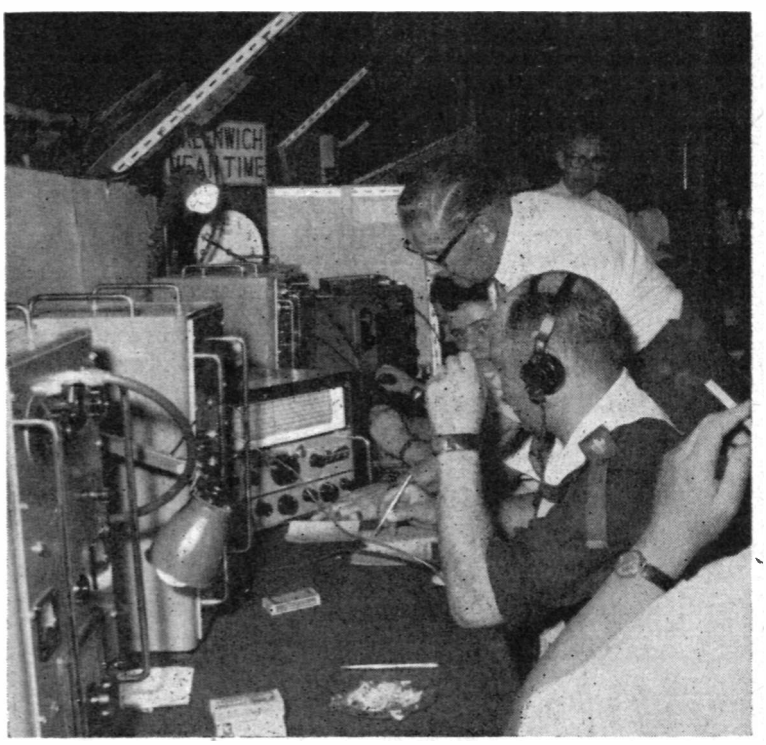
We had 36 entries for last year's event, which was won by **Stourbridge**, with **Bailleul** and **Harlow** a close second and third. The collection of a winning aggregate of points necessitates striking an intelligent balance between working all the stations available and concentrating on inter-Club contacts. The latter are very important, but their loss may be made up by a large number of non-Club contacts if the band is sufficiently busy to make these possible.

Doubtless hardened and regular competitors are already working out their strategy—which may be completely changed by the prevailing conditions during the actual event.

It is now pretty well established that to be in the first three for MCC calls for a very good station, with a team of really efficient, contest - experienced operators, determined to work everything on the band. In this context, to achieve a place in the next six out of an entry of 30-plus can likewise be regarded as a creditable performance. However, this does not at all mean that those stations not in the first ten do not also have a good time, even if they do not get a high place.

The point is that Clubs in particular areas of the country are, in effect, also competing with one another, locally; moreover, by using the Contest to train and encourage their not-so-experienced operators, a team can be built up with a good chance of getting a front place in later years—several Clubs do just this, and are content if they can, as it were, see progress up the table of results. And whether your Club is high or low in the finish, MCC is always a happy and interesting occasion, worth while for its own sake, as those who enter for it so regularly year after year would confirm. At any rate, we are hoping to see a total entry this year which tops the 40-mark.

And so to this month's Activity Reports, from 19 local Club groups . . .



A view of the operating position at GB3SP, the Scout Jamboree station at Sutton Park, on the air during the early part of August—see "Short Wave Magazine," pp. 357-359, September issue. In this photograph, G3CNV is in the headset, with G3DO (white shirt) on his right. The transmitters are LG.300's, and the receiver in view is a G.E.C. BRT-400.

Chelmsford is a newly-formed Club, which meets at Marconi College, Arbour Lane, Chelmsford, on the first Tuesday of each month. At the September meeting there was a display of 160-metre transmitters and a talk by G3GNQ on 160-metre Mobile working. The October meeting will take the form of a talk and possibily a demonstration of Hi-Fi equipment. **Cornish** had an outing on August 25, with a visit to North Hessary Tor TV Station, which was combined with a trip to Plymouth and a meeting with the Club in that town. The October meeting will have been held by the time this is in print.

Cray Valley had a G.E.C. talk on Light and Lightning at their September meeting. The next event, on October 22, will be an exhibition of members' home-built gear. *Venue:* Station Hotel, Sidcup, at 8 p.m.—and a cordial invitation to visitors. **Dorking** will be meeting on October 8 at the Star and Garter Hotel (adjacent to Dorking North Station) for a Film Show, at 7.45 p.m. Visitors will be welcomed.

Leeds opened their new season on September 27 and meet in future on Friday nights, 7.30 p.m. at the Swarthmore Adult Education Centre, 4 Woodhouse Square, Leeds, 3. Their future programme will include visits to factories and radio stations, and they will be delighted to hear from, or meet, prospective members. On October 4 there is a Junk Sale; October 11, Plans for rebuilding the Club Tx; and October 18, a talk.

North Kent meet on October 10 to hear about A Simplified Approach to Filter Circuits, by G3BHF. On October 24 they hold their Brains Trust (questions invited). Both meetings, at which visitors will be welcome, are at the Congregational Hall, opposite Bexleyheath Clock Tower. **Plymouth** held their business meeting on October 1, and have an Auction

NAMES AND ADDRESSES OF CLUB SECRETARIES REPORTING IN THIS ISSUE:

BAILLEUL: G. Seeney, G3HDD, B.R.S., Bailleul Camp, Arborfield, Berks.
BURY: L. Robinson, 56 Avondale Avenue, Bury.
CHELMSFORD: R. D. May, G3KTF, 46 Stansted Close, Chelmsford.
CORNISH: J. Brown, G3LPB, c/o W. A. Thomas, 38 Lower Market Street, Penryn, Cornwall.
CRAY VALLEY: S. W. Coursey, G3JJC, 49 Dulverton Road, London, S.E.9.
CRYSTAL PALACE: G. M. C. Stone, G3FZL, 10 Liphook Crescent, London, S.E.23.
DORKING: J. Greenwell, G3AEZ, Wigmore Lodge, Beare Green, Dorking.
EDINBURGH: M. Darke, GM3KGK, 44 Howe Street, Edinburgh, 3.
HASTINGS: W. E. Thompson, 8 Coventry Road, St. Leonards-on-Sea.
LEEDS: J. R. Hey, 40 Richmond Avenue, Headingley, Leeds.
NEWBURY: J. A. Gale, Wild Hedges, Crookham Common, near Newbury.
NORTH KENT: D. W. Wooderson, G3HKX, 39 Woolwich Road, Bexleyheath.
PLYMOUTH: C. Teale, G3JYB, 3 Berrow Park Road, Peverell, Plymouth.
PURLEY: E. R. Honeywood, G3GKF, 105 Whytecliffe Road, Purley.
SCIENCE MUSEUM: G. C. Voller, G3JUL, Science Museum, London, S.W.7.
STOCKPORT: G. R. Phillips, G3FYE, 7 Germans Buildings, Buxton Road, Stockport.
SUTTON AND CHEAM: F. J. Harris, G2BOF, 143 Collingwood Road, Sutton.
WIRRAL: H. V. Young, G3LCI, 9 Eastcroft Road, Wallasey.
WORTHING: J. R. Toothill, 113 Kings Road, Lancing.

MCC—TWELFTH ANNUAL TOP BAND CLUB TRANSMITTING CONTEST

RULES

1. ***Duration:*** Saturday, November 16; Sunday, November 17; Saturday, November 23; Sunday, November 24. On each of these days between the hours of 1600 and 1900, GMT (twelve operating hours in all).

2. ***Frequency and Power:*** All contacts will be made in the 1800-2000 kc amateur band, using CW only, with a power not exceeding 10 watts to the final stage. All reasonable precautions will be taken to avoid interference with other services using the band.

3. ***Call Signs:*** Where a Club has its own transmitting licence and call-sign, that call-sign is to be used. Clubs without their own call may use a member's station, provided this is nominated as their official entry by the Club Committee.

4. ***Calling:*** Club stations will call "CQ MCC" and will sign off at the end of each transmission with "AR MCC K," or "AR MCC VA." Clubs in contact with one another will identify themselves by giving, after the RST report, "QRA" instead of "QTH," followed by the name of the Club. Abbreviated forms are permitted, *e.g.* "QRA Clifton Club" or "QRA SRC Club," but the word **Club** must be sent in every case. Clubs working non-Club stations will send their QRA and will log the other station's QTH.

5. ***Scoring:*** Other Club stations may be worked once each day of the Contest and will count for *three points each time*. Non-Club stations may be worked only once during the whole period of the Contest and will count for *one point*. The three points for an inter-Club contact will not be claimed unless the "QRA" and the word "Club" have been logged. Thus any Club station may be worked four times, for twelve points, but other amateur stations only once, for one point.

6. ***Logs:*** Contest logs to be set out as follows: Quarto or foolscap sheets should be ruled into seven columns, headed: Col. 1, *Date and Time*. Col. 2, *Call of Station Worked*. Col. 3, *QRA, if Club*. Col. 4, *QTH, if non-Club*. Col. 5, *RST, outwards*. Col. 6, *RST, inwards*. Col. 7, *Points claimed for contact* (3 or 1). Col. 7 must be totalled at the bottom of each page and the running totals brought forward.
The last page should contain the following summary: Club contacts (number) at 3 points each:— total figure. Non-Club contacts (number) at one point each:— total figure—Grand Total. Comments on experiences during the Contest equipment used, number of operators employed, and general impressions of the event are invited, and should be added to the Log.

7. Any Club stations receiving reports consistently worse than T9 will be liable to disqualification.

8. Logs, addressed to "Club Secretary," *Short Wave Magazine*, 55 Victoria Street, London, S.W.1, must be posted to reach us by **Wednesday, December 4, 1957.** The Editor's decision on the results will be final, and will be published in the January, 1958 issue of *Short Wave Magazine*.

Sale on October 15. **Purley** had an informal get-together on September 6, and a talk by G6JJ on Simple Frequency Measurement on September 20.

Sutton and Cheam meet on October 15 to hear G6CL on The History of Amateur Radio, and on November 19 for a talk on Tape Recording by G8SM.

Bailleul reports a "thinning-out" of activities during the summer, but a busy winter season is keenly anticipated, including such events as the visit from Slade, and the attendance at Newbury's Hamfest in October. G3IHH will again be heard in MCC (Bailleul came second in that event last year) and will also be operating on as many bands as opportunity permits.

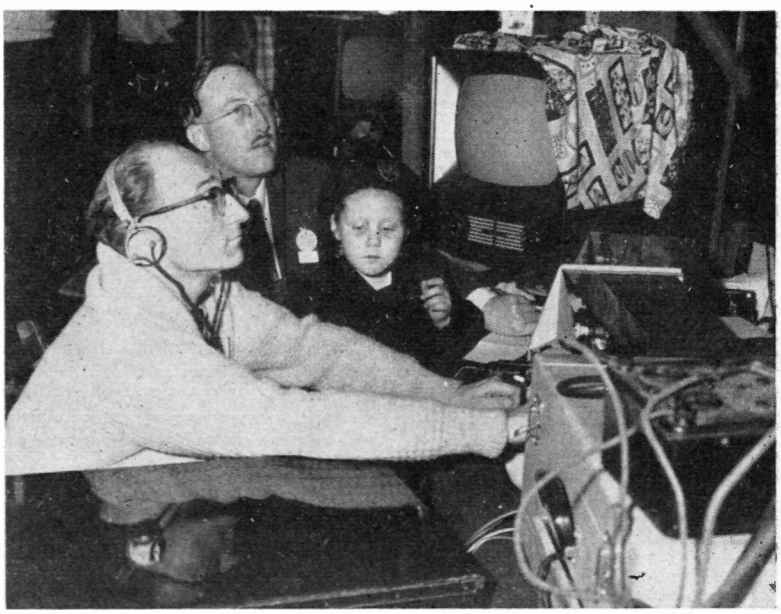
Crystal Palace meet on October 19 for a Mullard Film Show on Special Quality Valves, and on November 5 G3FZL will talk on Inductance, in the new R.A.E. series. Both meetings at Windermere House, Westow Street, London, S.E.19, 7.30 p.m. **Bury** meets on the second Tuesday, 8 p.m. at the George Hotel, Kay Gardens. On October 8, G2IG will talk on Matching Matters, and on November 12 G2GA will give a lecture called "An Old Timer Looks Back."

Edinburgh gather on Wednesdays, at 7.30 p.m., in Unity House, Hillside Crescent. The October lecture will be on Common Faults in TV Receivers, and on the 23rd there will be a Sale of Goods and a Magazine Review. For November there is a talk on the Miniciter, by GM3EQY.

Newbury's Annual Hamfest takes place on Sunday, October 13, at the Headquarters—from 3.30 p.m. until 8.30 p.m. Tickets are 6s. 6d., from the hon. sec. Features will include a sit-down meal, a draw for prizes, a Film Show, and there will be a talk-in station for mobiles, operating between 1900 and 2000 kc. A cordial invitation is extended to all. There will be no evening meeting during October.

The **Science Museum** Radio Society meets on October 8 at 6 p.m. for a talk, with demonstrations, on High Fidelity and the Philips Output Transformerless Amplifier. Enquiries in connection with seating should be made to G. C. Voller, G3JUL, at the Science Museum, London, S.W.7 *(Tel.: KENsington 6371, Ext. 237).*

Stockport hold their Hot-Pot Supper on October 23, and on November 6 two Mullard films will be shown, covering Ultrasonics and "Particles Count." **Wirral** meet on the first and third Wednesdays at the YMCA, Birkenhead, and are anxious to recruit new members. They hope to run a local R.A.E. Course, and G3CSG is already transmitting slow Morse and can also arrange individual instruction. On October 16 there will be a Junk Sale, and on November 6 a talk on Workshop Practice.



Study in concentration at the British Amateur Television Club's display at the Dagenham Show last July — see pp. 296-297 August issue "Short Wave Magazine."

Worthing held their AGM in September, when the chairman and the hon. secretary were re-elected. On October 14 they have a talk on Electronic Computers; following meetings will be on November 11 and December 9, all 8 p.m. at the Adult Education Centre, Union Place.

Hastings are together every Tuesday at their Headquarters, 22 Middle Street, and work on the Club Tx is proceeding. When operating as G6HH/A from the Hobbies Exhibition, they worked DLØRR at a similar exhibition in Recklinghausen, as reported in the August issue; the operator on DLØRR was DJ3OD, who has recently presented the Hastings Club with a handsome trophy in the form of a miniature miner's lamp in lacquered brass, suitably engraved, which will be made a trophy for competition each year. DJ3OD has been made an honorary member of the Club.

IN TROUBLE AGAIN!

It is reported that Danny Weil—now being described in the popular Press as "one of the best known hams in the world"—after being held up by bad weather in Stranraer in the new sloop he acquired as *Yasme II*, is now looking for a *Yasme III!* It appears that when refuelling in Holyhead on September 16, *Yasme II* caught fire and became a total loss—covered by insurance this time, but £1,000-worth of camera equipment was destroyed. Danny himself had to be rescued by a Trinity House tender . . .

SMALL ADVERTISEMENTS

9d. per word, minimum charge 12/-. No series discount; all charges payable with order. Insertions of radio interest only accepted. Add 25% for Bold Face (Heavy Type). No responsibility accepted for errors. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1.

SITUATIONS VACANT

MINISTRY OF TRANSPORT AND CIVIL AVIATION : TRAINEE COMMUNICATIONS OFFICERS. Applications invited from men and women age at least 18. Candidates must have an elementary knowledge of radio communication principles, be able to send and receive Morse signals at 20 words a minute, type or teleprint at 30 groups a minute, transmit and receive telephone messages. Weekly rates of pay whilst under training from £6 1s. 9d. at age 18 to £8 17s. 6d. (men) and £8 13s. 0d. (women), at age 25 or over, plus free meals and accommodation. On successful completion of training course, annual salary will be £347 at age 18, £568 at age 25 or over, rising to £706 for men ; £349 at age 18, £536 at age 25 or over, rising to £637, for women. Slightly lower rates at certain stations. Women's pay being improved under equal pay scheme.—Application form and further particulars from Ministry of Transport and Civil Aviation (ESBI/Comm.), Berkeley Square House, London, W.1.

TRADE

CONVERTERS 14, 21, 28, 50 mc, s.a.e. details. Co-Ax Aerial Relays, 24-volt, 12/6. Hi-Pass Filters, 15/-. 72-ohm semi air-spaced coax, 8d. yd.—G3FXB, 86 Cross Road, Southwick, Sussex.

SMALL ADVERTISEMENTS, TRADE—*continued*

QSL CARDS AND LOG BOOKS, G.P.O. APPROVED. CHEAPEST, BEST. PROMPT DELIVERY. SAMPLES.—ATKINSON BROS., PRINTERS, LOOE, CORNWALL.

TELEVISION INTERFERENCE. — Receiver Filters: High-pass E.5037, 30/-; Low-pass E.5031, 30/-; Composite Band I/III, 49/6. Transmitter Filter E.5034, 80 dB, 1 kW, £6.—Labgear (Cambridge), Ltd., Willow Place, Cambridge.

QSL's and Logs by Minerva. The best there are.—Samples from Minerva Press, 2, New Road, Brentwood, Essex.

WANTED: BC610 Hallicrafters, ET-4336 Transmitters. BC-312 Receivers, BC-221 Frequency Meters and spare parts for all above. Best cash prices.—P.C.A. Radio, Beavor Lane, Hammersmith, W.6.

G3CGD QSL's. Fixed and mobile samples on request. Printing enquiries welcome.—30 St. Luke's Road, Cheltenham.

S.640 or similar Receiver. Three required for Missionary Service in Ethiopia. Must be reasonable price and good condition.—K.W. Electronics, Ltd., Wilmington, Dartford, Kent.

READERS' ADVERTISEMENTS

3d. per word, min. charge 5/-, payable with order. Please write clearly, using full punctuation and recognised abbreviations. No responsibility accepted for transcription errors. Box Numbers 1/6 extra. Replies to Box Numbers should be addressed to The Short Wave Magazine, 55 Victoria Street, S.W.1.

S.640 required, preferably as new without any modifications. State price, etc.—Ostens, 27 Seafield View, Tynemouth, Northumberland.

EDDYSTONE 680X, perfect, 6 months old, with speaker and blocks. Domesticities force sale, £90 or nearest. London area.—Box No. 1910, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: Army 12 Tx, with manual, £12 (o.n.o.). 1403 Tx with valves, £4 10s. 0d. P/Pack Type 247, 580v. 200 mA, 6.3v. 3a., £2. VFO, 80 metres, self contained, just requires Ae, £5. ATP35, 12/-.—G3JYA, 245 A.M.Q., R.A.F. Marham, Nr. Kings Lynn, Norfolk.

B2 complete in case, with spare valves, £14. Grundig Reporter 500L Recorder, as new, £40—or would exchange for good communication Rx. Various transformers, cheap.—Lyske, 63 Church Street, Portadown, N. Ireland.

EDDYSTONE 659 AC/DC Marine Receiver in good condition for sale. £20, carriage free.—R. H. Titcombe, Fullersmoor, Argoed View, New Brighton, Nr. Mold, Flintshire.

807 BRITISH, ceramic bases, EF50 (Syl.), 6J5G, 5Z4 VR100, 6Q7G, VR54, others. All 4/6, absolutely guaranteed.—40 Belmont Gardens, Edinburgh.

CR300 with P/Pack and manual, £11; R.1155 with built-in speaker, p/pack, O/P stage, £5; chassis, components, and the remains of two broadcast receivers, RF24, BC-453 and T.1154, £2. Wanted: CR-100.—Watson, Coppice Farm, Penn, Bucks.

MINIMITTER TX for sale, purchased April this year, modulation meter in place of bulb, in perfect condition, price £65.—Desmond, G5VM, Compton, Meriden Road, Hampton-in-Arden, Warks.

SMALL ADVERTISEMENTS. READERS—*continued*

FOR SALE: AR88 with Trix A9-2K Speaker, headset and manual, £40 (o.n.o.). After 6.00 p.m. —T. A. Quarter, Queens Road, Fakenham, Norfolk.

SELL CR-100, good condition, recently re-sprayed, fitted S-meter, N/Limiter, 717A/HF, works well, also L/S. Buyer collects. £15.—Street, 67 Oldbury Road, Worcester.

BC221, Int. Stab, P/Pack, perfect, £8. Manuals: TA-12B/C £1, AR88LF 17/6, GPR-90 17/6, MBR-5 17/6, NC-300 17/6 ; 200 R/TV Service sheets 1/- each ; or £7 10s. the lot. 726A Klystron, with base, couplings, tuner, 30/-. Command tool sets, 10/6. Avo Uni/Minor. 40/-. 100 μA meter, 10/-.—Box No. 1911, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

RADIO AND TV SERVICING, 6 Volumes, published by George Newnes, mint condition, cost £8. Sale or exchange. Offers?—G3LBO, 13 Oakwood Drive, Rotherham, Yorks. (*Tel. 5159*).

SALE: New Minimitter, only used 12 hours, £80. Panda PR120V and low-pass filter, worked 162 countries, £50.—Paine, G6PR, 38 Alpha Street, Slough, Bucks.

BEGINNERS' MORSE RECORDS (L.P. 33⅓) complete course with booklet, designed to pass G.P.O. test at 12 w.p.m. easily, only 45/-, send P.O. now, course by return.—45, Green Lane, Purley, Surrey (*Upl. 2896*).

FOR SALE : BRT 400 Rx, mint and perfect, manual, £75. RX Type RL85, VHF 28-100 mc, internal power supply, magic eye tuning, BFO, etc., very fine job. £15. TK5 Tape Recorder (Grundig), complete mike, telephone and broadcast attachments, brand new, £45. Tx/Rx Mk. III (B2 minor), mint and complete as issued, power pack, spares, key, phones, manual, £12.10. Evershed Vignoles Bridge Meg Tester, cost £50—sell £10, perfect. Battery Charger by Newton, all voltages, all rates, fully metered, cost £40, sell £10. 12 Watt Hi-Fi Amplifier, P/P 807's, internal power (230v. AC), £12.10.—R. L. Cutler, Walberton, Arundel, Sussex.

FOR SALE : 100-watt Tx, VFO, self contained : "Elizabethan" Tx as exciter or 50w. Tx, 829B PA for 10 metres, two 5B254M PA for 15 and 20 metres. Four Power supplies, two racks, modulator P/P EL38 ; two-metre Tx, PA 829B, 80w. Everything for £40. Photo July *Short Wave Magazine*. G3JHI improving layout.—Flt.-Lt. Hathaway, Officers' Mess, R.A.F. Odiham, Hants.

R.A.F. ground station rack type 6, containing amplifier, power unit local control panel, remote control panel, new meter and valves fitted, handbook, excellent condition, £5.—M, F. Smallwood, Publicity Officer, Southgate RSGB Group, 7 Reservoir Road, Southgate, N.14.

AR88D, Hammarlund Super-Pro, best offers? SCR522, £3. RB150, £5. New prop-pitch motor, £5. Garrard Auto Changer, £3. Stacks other gear, s.a.e. list.—Holland, Birchfield, Theydon Mount, Epping, Essex.

RECEIVERS, P22, 27-300 mc and P/Pack, £12. R1294 500-3000 mc, rough, £10. Mackay-128 15-650 kc, £8. 1252 Wavemeter, 22-30 mc, £4. Tuning Unit 207A, £2. Other gear. Buyer collects, Reading. —Box No. 1913, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

SMALL ADVERTISEMENTS, READERS—*continued*

SALE: B2 Tx/Rx P/Pack, coils, key, 2 xtals, £10 plus carriage, o.n.o.—Box No. 1914, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

10 MTR. Complete 25-30 watt Mobile Rig, 12v. Tx and Converter, latest Philips car radio, generator, mike, with 12v. battery, rig worked WAC phone, £35 lot, or exchange for good Rx. Lancs.—Box No. 1912, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

WANTED: 25 watt CW transmitter for 3.5/7 mc, with P/Pack and VFO, TVI-proof and compact job.—Box No. 1915, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

FOR SALE: German Valves, RV12P2000, etc., other valves and gear, state wants, s.a.e. please.—Bromby, 19 Alverton Avenue, Poole, Dorset.

LATE G3IXX STATION, 6-Band 5RV 75w. Tx, with 3 power supplies, two 300v., one 600v., S.640 Rx modified RF Stage, Class-D Wavemeter, Wilcox-Gay VFO, valves, etc., s.a.e.—G3JDI, 119 Langley Crescent, Dagenham, Essex.

WANTED: Eddystone 750, must be perfect and in mint condition. State lowest price for cash.—Write: T. Watson, 86 Mount Merrion Park, Belfast, Northern Ireland.

WRITER and lecturer prepares scripts, articles and notes on scientific and general subjects.—G4XB, 19 Woodfield Avenue, Farlington, Cosham, Hants.

SUPER-PRO for sale, overhauled 2½ years ago at cost of £31, offers around £25 accepted. Wanted: Compact, preferably commercial, Table Topper over 50 watts.—301 Eaton Road, West Derby, Liverpool, 13.

NO. 12 Tx, 1.7-17 mc, 50 watts CW, 25 watts phone, 240v. mains, £12.—P. Miles, 176 Sarehole Road, Hall Green, Birmingham.

EDDYSTONE S.640, Pye PCR-2, R1224A Receivers, Wilcox-Gay Oscillator, Commercial 807's PA Labgear Coils, Wavemeter W1191, Power Pack Type 247, New 1956 *ARRL Handbook*, 73 *Short Wave Magazines*, 62 *RSGB Bulletins*.—Offers to GW3FEJ, 31 Terrace Road, Swansea.

WANTED: ATU for Panda PR-120v. and mains powered Class-D Wavemeter.—G3LXH, 27 Haverstock Court, Orpington, Kent (*Foo. 4266*).

AC VOLTMETERS 0-400v. 12/6. AC/DC Ampmeters, 1.5 amp, 12/6. Mains Transformers. 250-0-250. 6.3v. 5v., 8/6. 100 yds. copper wire, .0006/7, 7/6. Pullin 100 Meter, £8 10s. All new. 17 Kent Road, Atherton, Manchester.

VALVES: All types Octals, UX, British, Rx, Tx, Meters, Xtals, AR88 Spares.—J. Brown, Waterworks, Penryn, Cornwall.

FOR SALE: R1155B with 21-28 mc converter, power pack and output stage, £8. R1116A (125 kc-1500 kc, 2-20 mc) battery receiver with power pack, £8. Rx power pack, 230v. input, 250v. 100 mA, 6.3v. 3a. output, £2. One stripped TU-10B Unit, 7s. Carriage extra on all items.—Yeo, 48 St. Albans Road, Edinburgh, 9.

NEW R1481 (Band II) receiver, £4 10s.; BSR ribbon microphone, £4 10s. Wavemeter W1310, 150-240 mc, £2 10s. Lightweight power tool with 40 fittings, case, £3 10s.—39 Kingsbury Road, Birmingham, 24.

SMALL ADVERTISEMENTS, READERS—*continued*

MORSE CODE: Course by leading American System. Complete Junior and Advanced Lessons. £3 lot.—Ostens, 27 Seafield View, Tynemouth, Northumberland.

SALE: Wireless Sets No. 19, brand-new, perfect order, 55s. (carriage extra).—Martin, 15 Mansfield Road, Worthing, Sussex.

COMMAND TRANSMITTERS, 11/-; 80-ohm resistors (aerial load), 5/6; Geloso VFO and dial, £6; 75-watt, VFO modulated Table Topper, £18. Carriage extra. — G3ATL, Hugglescote, Leicester.

AR88D (new, or near new) wanted; good price paid; must be absolutely immaculate inside and outside. BS-348 Rx, FB, self-contained, 200-250v, AC, £18, or consider part-exchange for S-27 or S-36, O.W.H.Y.?—A. Fletcher, 62 Moorbridge Lane, Stapleford, Notts.

CR-100, good condition, £17 10s. (carriage paid) England, Scotland, Wales.—G2OS, 27 Seafield View, Tynemouth, Northumberland.

ACTIVE YOUNG HAM and XYL seek near London accommodation; prefer small garden for airing very junior operator T9S5 (and OM's Aerial).—Johnny Loader, 19 Waverley Park, Shelford, Cambridgeshire.

DECCA RADIO FEEDER UNIT, 8 wave-bands covering 13-2,000 metres; 6 valves; push-button wave change; good condition. Offers?—Box No. 1916, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

VALVES from 1/6; components, new and used, all excellent condition. Stamp for List. Service Sheets.—G2DJA, 32 Neasden Lane, N.W.10.

MAGAZINES: *QST*, 1932 to 1949, all copies; *Short Wave*, 1950-1954; *RSGB*, Volumes 25-28. Offers or W.H.Y.? — G3FSI, 36 Sunnyside Gardens, Upminster, Essex.

WANTED: Medium Power, TVI-proof, all-band Transmitter.—Full details to J. E. P. Philp (DL2GA), 2 L. of C. Sig. Regt., B.F.P.O. 34.

SALE: AR88D, fitted S-meter, matching speaker; excellent condition. Spares: crystal, few valves, 2 manuals with latest R.C.A. gen. Avo Electronic Test Meter; Hunt's RC Bridge. *Wireless World*, 5 vols., 1952-6, 1953 vol. bound. *Radio Electronics*, 5 vols. 1952-6. *Radio Constructor*, 8 vols. from Aug. 1949.—Offers to: D. Tilcock (G3JYV), 67 Fleming Mead, Mitcham, Surrey.

AR88LF, v.g. condition, £50; CR100, modified AF section, £10 (o.n.o.); S27, useful for spares, £10; 3339 Cossor Oscilloscope, useful for spares, £5; TF144G signal generator (15 kc to 25 mc), v.g. condition, what offers?—Box No. 1917, Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1.

COMMUNICATION RECEIVER, Eddystone 680X, in mint condition. Reasonable offer.—Mortimer, 51 Townhead Road, Dore, Sheffield.

Short Wave Magazine Advertising gives World-Wide Coverage.

HENRY'S (Radio) LTD

5 Harrow Rd., Paddington, W.2

Opposite Edgware Road Station

PADdington 1008/9

Open Monday to Saturday 9-6. Thursday 1 p.m.

Send 3d. for 28-page Catalogue.

QUARTZ CRYSTALS

FT243
Fundamentals

80 Types 5706.667 Kc/s to 8340 kc/s. (In steps of 33.333 kc/s). 120 Types 5675 kc/s to 8650 kc/s. (In steps of 25 kc/s).
(*Excluding Types* 7000/7300 *and* 8000/8300).
5/- EACH

Complete Sets of 80 Crystals ...	...	**£6 0 0**
Complete Sets, 120 Crystals ...	...	**£7 10 0**

7000 kc/s. to 7300 kc/s. in steps of 25 kc/s.
8000 kc/s. to 8300 kc/s. in steps of 25 kc/s. **7/6** each

FT241A — 54th HARMONIC
80 Types 20 Mc/s to 27.9 Mc/s. (in steps of 100 kc/s.)
(Excluding 27 Mc/s.).
5/- EACH — Complete Set of 80 Crystals, **£6**
27 Mc/s., **10/-**

100 Kc's.	Gold Plated D.T. Cut	**15/-**
150 Kc's.	Two Pin Round	**12/6**
160 Kc's.	Two Pin 10X	**12/6**
200 Kc's.	FT241A	**10/-**
500 Kc's.	FT241A	**10/-**
500 Kc's.	Brook's Special Holder	**15/-**
5000 Kc's.	Piezo 2-Pin Holder	**12/6**

P.O. TYPE 4B CERAMIC
100 kc/s 819.6 Kc/s
163.9 Kc/s. 1000 Kc's. **15/-** EACH

CERAMIC 2-PIN BANANA PLUG
15,010 Kc/s.; 16,135 Kc/s.; 16,435 Kc/s.; 18,026 Kcs.; 15,110 Kc/s.; 16,335 Kc/s.; 16,700 Kc/s ; 18,125 Kc/s
10/- EACH

TCS COLLINS TYPE 3-PIN FT249
1665.5 Kc/s.; 1700 Kc/s.; 2073.5 Kc/s.; 1962.5 Kc/s.; 2072.5 Kc/s.; 2410 Kc/s. **10/-** EACH

DC 11A TWO-PIN
1740 Kc/s.; 1780 Kc/s.; 1764.5 Kc/s., **7/6** EACH

MARCONI S.T.C. 10X TYPE 2-PIN IN KILOCYCLES

10,166	10,511	10,856	11,788	1613.25	2118.25
10,189	10,534	10,878	11,814	1650	2065.75
10,233	10,545	11,437	11,851	1761	2067.5
10,245	10,557	11,463	11,876	1775	2087.5
10,300	10,567	11,500	12,685	1780	2089
10,433	10,622	11,501	1544.4	1835	2090
10,445	10,755	11,526	1566.5	1930	2196
10,500	10,767	11,587	1579	1981	2295
10,501	10,823	11,751	1588.68	2012	2315
					2430

7/6 EACH

N.B.—ALL CRYSTALS TESTED FOR ACTIVITY AND GUARANTEED

TRANSISTORS

JUNCTION TYPE P-N-P.
British Manufactured.

RED-SPOT 800 kc/s Audio Frequency	**10/-**
BLUE-SPOT 1.6 Mc/s and Frequency Changer	**15/-**
WHITE-SPOT 2.5 Mc/s R.F. and I.F. Amp	**20/-**

All Transistors are Tested and Guaranteed
N.B. The Red-Spot is similar to Mullard OC71

Over 300 different types of B.V.A. and American valves in stock. Send for Lists

"TRANSISTOR—8"

Push-Pull Portable Superhet
CAN BE BUILT FOR £11 . 10 . 0

This Portable 8 Transistor Superhet is tunable for both Medium and Long Waves and is comparable in performance to any equivalent Commercial Transistor Set.
Simplified construction enables this set to be built easily and quickly into an attractive lightweight cabinet supplied.

TEN STAR FEATURES
- ★ 8 Specially Selected Transistors
- ★ 250 Milliwatts Output Push-Pull
- ★ Medium and Long Waves
- ★ Internal Ferrite Rod Aerial
- ★ 7 x 4 Elliptical High Resistance Speaker
- ★ Drilled Plastic Chassis 8½ x 2½in.
- ★ Point to Point wiring and practical layout
- ★ Economical. Powered by 7½ v. battery
- ★ Highly sensitive
- ★ Attractive lightweight contemporary case

Pair OC72's supplied 40/- extra. Call and hear demonstration model.

We can supply all these items including Cabinet for **£11/10/0**
All parts sold separately

Send for circuit diagrams, assembly data, illustrations and instructions, and full shopping list **1/6**.

"EAVESDROPPER" 3-TRANSISTOR POCKET RADIO

Variable Tuning

We can supply all the components for building the above set as per "Radio Constructor." With plastic case, **77/6**.

With Acos Mike, **90/-**. Single Headphone, **82/6**. With Miniature Hearing Aid, **92/6**.

MINI-TWO 2 TRANSISTOR MINIATURE POCKET RADIO

The smallest Transistor Set offered on the market. Variable tuning. Drilled chassis, plastic case, size 3 x 2 x ¾in. Miniature hearing-aid, two transistors and all components including 1½ v. battery, circuit and full practical layout diagrams. Total cost **49/6** complete.

TRANSISTOR SIGNAL TRACER
Complete Kit with 2 Transistors, Components, Plastic Case, and Phones with Circuit **42/6**.

TRANSISTOR SQUARE WAVE GENERATOR
Complete Kit with 2 Transistors, Components, Plastic Case, and Circuit. **25/-**.

DIODES

B.T.H. GERMANIUM ...	**1/6**
MULLARD OA74	**2/6**
IN21	**3/6**
IN22, IN23, IN21A	**5/-**

"HOMELIGHT"
2 Transistor Personal Portable
Variable Tuning

We can supply all components including 2 Transistors, Diode, Resistors, Condensers and Miniature Hearing Aid and Plastic Case size 4¼ x 2⅞ x 1⅝ and 1½ v. Battery. FOR **52/6**.
All items sold separately.

MODEL-MAKERS MOTORS
Two types available 12 or 24 v. with ⅛in. spindle ... **10/-** each

TRANSMITTER/RECEIVER SCR 522
Comprising the well-known BC625 and BC624A. The complete unit is in very good condition having very useful parts including Relays, Transformers, Condensers, etc. Less valves, **45/-**, carr 5/-.

TRANSMITTER/RECEIVER, Army Type 17 Mk. II
Complete with Valves, High Resistance Headphones, Handmike and Instruction Book
Frequency Range 44.0 to 61 Mc/s. Range Approximately 3 to 8 miles.
Power requirements Standard 120v. H.T. and 2v. L.T.
Ideal for Civil Defence and communications.
BRAND NEW **59/6**
Calibrated Wavemeter for same 10/- extra.

Printed by The Courier Printing Co. Ltd., Tunbridge Wells, for the Proprietors and Publishers, The Short Wave Magazine, Ltd., 55 Victoria Street, London, S.W.1. The *Short Wave Magazine* is obtainable abroad through the following : Continental Publishers & Distributors, Ltd., William Dawson & Son, Ltd. ; AUSTRALIA AND NEW ZEALAND—Gordon & Gotch, Ltd. ; AMERICA—International News Company, 131 Varick Street, NEW YORK. Registered for transmission to Canada by Magazine Post. *October* 1957.